Sensemaking in Command Centre Contexts

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ABSTRACT

This paper presents descriptive accounts from the work conducted at a Swedish fire and rescue service's command centre during a high risk protest. Sensemaking has been applied as a theoretical lens on the empirical data. Two specific episodes has been selected to demonstrate how the process of sensemaking is manifested in the context of the command centre. The paper also includes implications for design suggesting how information systems for this context should be designed to better support sensemaking.

Keywords

INTRODUCTION

This article presents the work conducted and sensemaking activities that took place at a fire and rescue service command centre during a high risk protest. Thousands of protestors and activists had gathered to protest against political injustice during a sports event where one of the involved nations was represented. To ensure the safety of the athletes, organizers and others, Swedish police took every precaution possible. The event area was secured under police law and fire and rescue took their part of the responsibility by organizing their operations to be able to response as effectively as possible to any situation that could occur. The main focus of the study was on how the work was organized towards the goal of being up to date with the ongoing situation, and how a team of commanders made sense of the situation, and how sense was established, maintained and acted on. During this event their information gathering strategy included multiple sources, ranging from public live streaming web cameras, news papers' online reports and photos, and information technology was an organizing resource (Calloway, 1996). Collaboration with the Police's command team was also conducted through appointed collaboration officers. Interestingly, one of the main information resources turned out to be live reports made by the activists.

The intention of this paper is to answer the question: how is the sensemaking process manifested in the context of a fire and rescue service command centre. Design implications related the design of the information systems intended to aid the work in this context is also suggested. The remainder of the paper is organized as follows. Section 2 includes theory and related research, highlighting how the theory of sensemaking has evolved and how it as been implemented in research on emergency and crisis management. Section 3 presents the research setting and approach, including the background to the event studied. Section 4 presents the findings and analysis of the data gathered from the study, and section 5 presents design implications suggesting how the design of information systems could better support sensemaking processes in the command centre context.

THEORY AND RELATED RESEARCH

Sensemaking has in the recent years become a popular analytical theory in several fields of science, and the study of crisis and emergency response and management is one field where it has received a great adoption (See Landgren, 2005; 2007, Muhren et al, 2008a; 2009 for examples) . Sensemaking has mainly been adopted since it "provides us with a lens to observe and understand how information is processed within and among organizations" (Muhren, et al., 2008). The key questions in the sensemaking process is "what is going on?" (Weick, 1995). Sensemaking has evolved from organization theory and a "central theme in both organizing and sensemaking is that people organize to make sense of equivocal inputs and enact this sense back into the world to make the world more orderly" (Weick, 2005). Wieck writes in his 1985 paper 'Cosmos and Chaos' that

electronic processing of information has made it harder to understand events that are represented on the screen compared to the real world experiences. The real world experience of a situation is most likely the best way to to make sense of an event, but in some cases it is not possibility to be present when the event takes place.

Weick has given the process several faces. His paper from 1985 explains how people facing uncertainty, ambiguity, ambivalence or equivocality people effectuate, triangulate, affiliate, deliberate, and consolidate to make sense of the situation (Wieck, 1985). In his book from 1995 'Sensemaking in organizations' the seven properties of identity, retrospect, enactment, social, ongoing, extracted cues, and plausibility are explained. The work presented in this paper uses a framework of the process of sensemaking presented by Wieck, Sutcliffe and Obstfeld (2005). Since the work observed at the command centre much followed the process they present, it was believed to be a proper analytical lens. Sensemaking as they present it consists of a series of activities. The framework consists of a social and systemic process of organizing information flux, noticing and bracketing, labeling, analysis based on retrospect and presumptions, actions, and it is organized through communication. The premiss is a state of flux and the sensemaking process begins "in acts of noticing and bracketing, its mixture of retrospect and prospect, its reliance on presumptions to guide action, its embedding in interdependence, and its culmination in articulation that shades into acting thinkingly" (Weick et al, 2005). The work conducted is a process to stay updated on the unfolding of an event, to understand "what the story is". The process works in retrospect by connecting current pieces of information with past experiences. Sensemaking is social and usually takes place in a larger social unit. Sensemaking is also about the "continued redrafting of an emerging story so that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism" (Weick et al, 2005).

RESEARCH SETTING AND APPROACH

In March 2009 several thousands of protestors and political autonomous groups gathered in Malmoe, Sweden, to join the protest against what was described as a political injustice in the Middle East. The trigger for the event was that one of the nations involved in the conflict was visiting Sweden to participate in a large sports event. To ensure the safety of the athletes, organizers and others, Swedish police took every precaution possible. The event area was secured under police law and arrangements and planning was made to ensure that almost every possible hostile situation could be managed. Over one thousand police officers were called in, armored vehicles were borrowed from Denmark and the fire and rescue service provided equipment capable of fighting small-scale fires.

The event was perceived as an opportunity to capture rich data describing how the fire and rescue service was affected by this event, and how the work practice was form by the unfolding events. A research team was granted access to observe the work of the fire and rescue service at the local command center during the day of the demonstration. The study was one of several cases in a larger ethnography inspired (Fetterman, 1998) project in the domain of Swedish crisis management. Participant observations and informal interviews were the methods used for data collection. The data was captured in field notes and photographs. Documents produced by the fire and rescue service during the day were also saved and stored for later analysis. The documents produced mainly contained log data and field notes from appointed collaboration officers. Material published on the activist web site Motkraft.net and on several media sites was also stored for later analysis. Informal interviews were also conducted to triangulate initial findings.

The fire and rescue service had organized their intelligence input by two strategies. One was to shadow the Police, and the other was to follow the unfolding of the event online from the command centre. Two coordination officers (CO) from the fire and rescue service were assigned to shadow the Police in an effort to better collaborate and coordinate during the event. The COs followed both the Police's work at their command center and the Police Incident Commander (PIC) responsible for the work out in the field. Throughout the day, the collaboration officers reported on decisions made by the police, how larger operations should be coordinated, and later during the protest small news updates were reported. The most communication was made via group-calling mode in an encrypted radio network. Many of the updates started or ended with the message "just so you know" indicating that the information should not be acted upon, but were used to provide better insight of the situation. The CO later reported in an interview that the reason of shadowing the PIC was because he was located "where the information was".

FINDINGS AND ANALYSIS

During the demonstration there was several specific situations reported. Some of these were specifically noticed by the team at the coordination center. There were discussions about several unknown factors such as the number of people, the different political groups and their intent, the development of the situation, and a lot of small discussion about specific reported incidents. This section presents two specific episodes mapping

according to the sensemaking process presented by Weick et al (2005). Many examples of the sensemaking process were observed during the day. The two presented in this paper includes the events of i) when a group of activists lit bengal torches, and ii) when information about the Police trying to pick fights with the protestors was published on Motkraft.net.

Episode 1 : "Bengal torches"

The two main methods used to get some structure into the great flow of information were to use a coordination officer to shadow the Police's incident commander, and also to follow the unfolding of the event online. Organizing the flux of information in this episode was to a large degree similar to how the whole demonstration was followed at the command centre. The main source of information about the development in the lines of the demonstration was reported by the coordination officer. Many of the events and incidents were also reported on in the protestors' online-reporting at Motkraft.net.

The collaboration officer made two specific reports about the torches. The first one mentions "heavy smoke" and the second is more specific and mentions "bengal torches". The situation was noticed when the collaboration officer reported on the event, although the event had already been reported on Motkraft.net.

> Motkraft.net log [authors translation]:
>
>> [12:42] The "We are the once who decides"-block lights two Bengal torches on their way to Gustaf Adolfs Square
>
> Fire brigade log [authors translation]:
>
>> [12:46] (Fire brigade log) Heavy smoke on South Street according to CO. Probably smoke bomb, no actions made so far
>> [12:50] (Fire brigade log) Bengal torches in the demonstration according to CO

One major difference between the two information sources, radio from the coordination officer and log entries in Motkaft.net, was that the radio transmission was live and raised the attention at the command center, while the updates on Motkraft.net did not have any notifications, and the site also had to be manually refreshed. To find new Motkraft.net updates somebody had to actively decide to manually refresh and look for new posts on the site.

The episode was first reported as "heavy smoke", a label that is vague and could be interpreted in as several different types of incidents. The next label presented is "smoke bomb", a more concrete label that better indicates the source of the smoke and also how to take action. The third label that was reported a few minutes later, "Bengal torch", is event more specific. The torch could just as the smoke bomb cause a fire if not handled properly. This final label frames the situation more properly. As the label not only indicates what the story is, it also suggests plausible acts of managing, coordinating, and handling the event. The labels set for the situation, together with the location from where it was reported, provide grounds for several presumptions to be made. The main presumption was that several people would probably notice the heavy smoke and maybe report it as a possible fire. The other presumption made was that the torches could possibly cause real fires. The presumptions made in the case of the torches was based on professional experience, i.e. socially and systemically grounded knowledge passed through education, training, and real world experiences. Sensemaking in its most basic form is about the question "what's the story", but when there is an understanding about what it is that is going on, the question quickly changes to "what do we do next?" (Weick, et al., 2005). Based on the reports from the coordination officer at 12:46 the SC quickly acted on the information and gave the instructions to the co-located dispatch center operators to not act directly on any incoming fire alarms from the area where the Bengal torches had been used, but instead hold for further investigations and validate the alarms. As in the previous example the situation was organized through communication, both from the field and internally at the command center.

Episode 2 : "Misinformation"

The second episode involves information that was posted online. Multiple sources such as online news reports, news broadcasts and online reportings made by the activists was used as the second strategy for gathering intelligence was to follow the events online. The source that triggered noticing was a post on the protestors' live reporting site Motkraft.net.

Motkraft.net log [authors translation]:

> [13:24] Civil clothed police officers are trying to provoke people along the route of the demonstration. People are calling out bad names at them. The

organizers of the demonstration has urged people to not allow themselves to
be provoked by the police.

The messages was noticed since it was out of the ordinary. Bracketing and labeling occurred when one of the commanders mentioned the post to his colleagues. In a discussion that followed, the label "misinformation" was set, which also indicated the presumptions made about the event and the information. Retrospective, social, and systemic reflections on the matter include normative ideas of how protestors and activists act. In this episode, the action consists of the choice to bring the manner up for discussion, and the same discussion also rested the case under the label "misinformation". This is also an example of how the situation was organized through communication. In a follow-up interview with the Police the event was interpreted as a possible arrest or attempts by the Police to get to instigators.

DISCUSSION

The findings shows that the sensemaking process presented by Weick at al (2005) works as an analytical lens. The second episode also shows that the sensemaking process is even observable in vague situations with no concrete outcomes except new knowledge within the team. The first episode shows how sensemaking and action occurs at a remote location. The basic steps of the process also work as a tool to further break down the actions and steps involved in the process. These insight also grounds for believing that the process may be used as a framework for analyzing technical platforms and services, and especially of how the design supports sensemaking activities. This section describes how the sensemaking framework can be transformed into implications for design.

The Organizing of flux may be improved by better structuring of data and information sources. The streams of information can be better managed, better brought into the work context, and better visualized. E-SOS (Collins, 2008) is an example of how such a service could be designed. In the case presented in this paper, there was no proper structure applied to the gathering of intelligence online. Web sites had to be manually visited and refreshed, and there was no means of sharing sources.

Noticing and Bracketing can be supported through simple awareness technologies, improved communication capabilities, and better means of information visualization. As in the episode of the bengal torches, there was no possible way to notice the Motkraft.net post about the torches except from a manual update. Simple and common tools such as a news reader or a auto-updating wall-mounted display could have made the team aware of the post at an earlier stage by either a visual or audio notification.

Labeling does not follow a common schema, and different labels are used by different actors. As seen in the case of the "misinformation", the Police, protestors, and Fire and Rescue service all used different labels. On Motkraft.net a situation was labeled as "provoked by the police", while the Police made retrospective sense of the situation in a follow-up interview by labeling it as "a probable arrest of instigators". As mentioned in the findings, the Fire and Rescue service labeled the post as "misinformation" from the activists. What the case indicates is that different actors and "sensemakers" will apply different labels on the same situation, and hence draw different conclusions of how to act on the situation. The case indicates that the social and communicative aspects of any technical solution will be of high importance in order to make proper sense of an event since we all perceive situations differently.

Retrospect was in the two episodes presented driven by experience, norms, and tacit knowledge. This type of long-term knowledge may be hard to support with the help of even novel technologies. It is however possible to support a short term retrospective process by making current information more accessible. Techniques such as timelines, plotting, and other forms of information visualization could aid in the process.

Presumptions about possible implications of the event is what drives us. The technology we use needs to support ideas, thoughts and hunches to be materialized and shared in order to bring them to the surface in a social context. The whiteboard has these capabilities when used in collaborative problem solving, but few other technologies have the capabilities to support "what-if" scenarios and hypothesis. Since presumptions and hypothesis can guide us in our actions, information systems should aid us in finding possible futures. Chemical dispersion models is one example where a possible future is used to make sense of an unfolding event.

Social and Systemic processes can be supported by an environment that utilized the knowledge of a group. It is of high importance that researchers or designers considers the social aspects of sensemaking. Sensemaking is as much a collective effort as it is individual. The design of technologies and artifacts should consider multiple users, collaboration and team-work.

Actions are manifested in many different ways. In command and coordination centers much of the action is related to communication, documentation, and problem solving. Depending on how well these actions can be

captured, the better material for later phases of the sensemaking process will be available. Notes, drawings, and scribbles on an analogue whiteboard will not easily be shared, stored or properly time-stamped. However, the same input on a digital whiteboard will however support these features, but it will introduce new problem areas such as the need for electricity, connectivity, and proper lighting conditions.

Organizing through communication has been shown to be a major component in collaborative sensemaking. The problem highlighted previously with different labels applied to the same situation shows the need of improved coordination and organization through communication.

Future Research

In order to better understand how Weick, Suthcliff and Obstfeld's model (2005) can be used as an analytical lens it will be applied to empirical material from more incidents. This material consists of interviews about a large scale terrain fire, and covers many more roles with different responsibilities and different positions in the organization. The design implications drawn in this paper will also be used as an analytical lens for evaluation of the information systems used in crisis and emergency management.

CONCLUSION

This paper presents findings from a high risk event where the work at the fire and rescue service's command centre was observed. The data that was gathered was analyzed using Sensemaking (Weick, et al, 2005) as a theoretical lens. Many occasions of sensemaking was observed, and two specific episodes were selected and presented in accordance with the sensemaking process of organizing flux, noticing and bracketing, labeling, retrospect, presumptions, social and systemic, actions, and organizing through communication. The episodes provide good examples of how sensemaking is performed in command centre contexts. The paper also includes implications for design that suggest how information systems for this context could be designed to better support sensemaking. Final remarks are also presented on how the these findings will be used in future research.

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