Sensemaking and Information Management in Humanitarian Disaster Response: Observations from the TRIPLEX Exercise

Willem J. Muhren
Tilburg University
w.j.muhren@uvt.nl

Bartel Van de Walle
Tilburg University
bartel@uvt.nl

ABSTRACT

The United Nations Disaster Assessment and Coordination (UNDAC) system is designed to assist the United Nations in providing information during the first phase of a sudden-onset emergency and in the coordination of incoming international relief at the site of the emergency. In the immediate aftermath of such an emergency, the UNDAC team will set up an On-Site Operations Coordination Centre (OSOCC) from where the operational activities of the humanitarian organizations responding to the emergency are coordinated. Information management is a key aspect in this phase as the information gathering, processing, and disseminating activities will determine the timeliness and appropriateness of the response by the international humanitarian community. Through participatory observation in the international humanitarian "TRIPLEX" exercise we explore how information managers in the OSOCC make sense of the disaster, how the immediate needs are assessed, and discuss how information systems could improve Sensemaking in these activities.

Keywords

Disaster response, Humanitarian assistance, Information management, Information systems, Sensemaking.

INTRODUCTION

Natural hazards and complex emergencies often result in humanitarian crises. Many international organizations, such as organizations of the United Nations (UN) and Non Governmental Organizations (NGOs), go out to the affected area to provide assistance. The UN, more specifically their Office for the Coordination of Humanitarian Affairs (UN OCHA), plays a crucial role in the coordination of the humanitarian assistance. Due to the growing impact of disasters (United Nations, 2004) and subsequently the growing humanitarian needs, there is an even larger need for efficient and effective deployment of the scare resources. Information management is a crucial activity in disaster response (Van de Walle and Turoff, 2007; Van de Walle et al., 2009). Without accurate and timely information on the impact of the disaster and the humanitarian needs, humanitarian assistance might be targeting the wrong areas, providing the wrong relief items, and be unnecessarily delayed, with disastrous consequences.

There are problems of ambiguity and equivocality when assessing the impact of disasters and the needs of the affected people. There is ambiguity when the humanitarian actors do not have a conceptual framework for interpreting information; equivocality occurs when humanitarian actors have several competing or contradictory conceptual frameworks (Zack, 2007). The theory of Sensemaking offers a set of constructs that makes it possible to analyze and understand how people cope with ambiguity and equivocality (Muhren et al., 2008b; Weick, 1995). In this contribution, we examine the process of needs assessment and the overarching information management processes in the immediate relief phase. Through participatory observation we have studied the management of information by the United Nations Disaster Assessment and Coordination (UNDAC) team and the needs assessment process in the International Humanitarian Partnership's "TRIPLEX" exercise. Our goal is to find out how information systems (IS) can support Sensemaking in these processes, aimed at preventing humanitarian actors from losing "their grab of what is happening" (Weick, 1999). This paper contributes to the scarce research on how IS can support Sensemaking in crisis response and management (Landgren, 2005; Muhren et al., 2008a) by providing concrete guidelines for support in the context of needs assessment in the immediate humanitarian response to a disaster.

The paper is structured as follows: First we give an overview of the theory of Sensemaking and indicate the potential of IS support for Sensemaking. We then briefly discuss the immediate humanitarian disaster response of the UN and the setting of the TRIPLEX exercise. After describing our research methodology, we thereafter give an overview of our observations regarding the information management processes by UNDAC in the exercise and the needs assessment process. We finally discuss the potential of Sensemaking support for both these processes, and present conclusions and directions for future research.

SENSEMAKING

Sensemaking is most obvious when people experience a lack of fit between what they expect and what they encounter (Weick and Meader, 1993). Weick distinguishes seven different resources for Sensemaking in such situations (Nathan, 2004; Weick, 1995; Weick, 1999; Weick, 2005), captured by the acronym SIR COPE, which we will briefly mention:

- Social context: Sensemaking is influenced by the presence of others. People need social anchors and a form of social reality (Weick, 1999).
- personal Identity: What the situation means is defined by who one becomes while dealing with it or what and who one represents (Weick 1995, p.20).
- Retrospect: "Sensemaking is influenced by what people notice in elapsed events, how far back they look, and how well they remember what they were doing" (Weick, 1999).
- salient Cues: Sensemaking is influenced by both individual preferences for certain cues as well as environmental conditions that make certain cues figural and salient (Weick, 1999).
- Ongoing projects: Sensemaking has no beginning nor end. Once you cannot keep pace with the action, you lose context, information, situated cognition, and tools made meaningful by actual use (Weick, 2005).
- Plausibility: "Sensemaking is about coherence, how events hang together, certainty that is sufficient for present purposes, and credibility" (Weick, 1999).
- Enactment: "Action is a means to gain some sense of what one is up against, as when one asks questions, tries a negotiating gambit, builds a prototype to evoke reactions, makes a declaration to see what response it pulls, or probes something to see how it reacts" (Weick, 1999).

For a more detailed description we refer the interested reader to Weick's work on Sensemaking in organizations (Weick, 1995).

These described resources for Sensemaking "have an effect on the willingness of people to disengage from, discard, or 'walk away' from their initial story and adopt a newer story that is more sensitive to the particulars of the present context" (Weick, 1999). An organization is more effective in reducing ambiguity and equivocality when the context is created in which these Sensemaking resources are characterized by the organizational supporting forms displayed in Table 1, rather than the organizational inhibiting forms (Weick, 2005). Therefore, to help Sensemakers in reducing ambiguity and equivocality, IS should be designed according to the organizational supporting form. Paraphrasing how Weick defined the organization form should be to support Sensemaking (Weick, 1999), IS should:

- encourage conversation (support social resources);
- give people a distinct, stable sense of who they are and what they represent (support defined identity);
- preserve elapsed data and legitimate the use of those data (support backward noticing);
- enhance the visibility of cues (support equivocal cues);
- enable people to be resilient in the face of interruptions (support continuous flow of events);
- encourage people to accumulate and exchange plausible accounts (support possibility as criterion for narratives);
- encourage action (support enactive as form of action).

Sensemaking Resource	Organizational supporting form	Organizational inhibiting form
Social context	Social resources	Solitary resources
Personal identity	Defined identity	Vague identity
Retrospect	Backward noticing	Forward noticing
Salient cues	Equivocal cues	Confirmed cues
Ongoing projects	Continuous flow of events	Episodic flow of events
Plausibility	Possibility as criterion for narratives	Probability as criterion for narratives
Enactment	Enactive as form of action	Reactive as form of action

Table 1. Sensemaking Resources and their Organizational Supporting and Inhibiting Forms (Weick, 2005)

In this contribution we want to explore how IS can support the aforementioned dimensions of the Sensemaking resources in the needs assessment process following a disaster.

UNDAC CASE STUDY

UN OCHA has the mandate to mobilize, direct and coordinate international assistance (United Nations General Assembly GA Resolution 2816 (XXVI) of 14 December 1971). The UNDAC system is part of OCHA and is designed to assist the UN in providing information during the first phase of a sudden-onset emergency and in the coordination of incoming international relief at the site of the emergency (United Nations, 2006, chapter C, pp.1-2). In the next section we will describe UNDAC and its activities relating to information management, heavily drawing on UNDAC's handbook (United Nations, 2006).

UNDAC humanitarian missions

In the last 15 years, UN OCHA deployed an UNDAC team to 183 missions, in 2008 among others to the floods in Haiti, Nepal, Honduras, and Panama, and the cyclone in Myanmar. UNDAC does not deliver humanitarian assistance, but provides support through on-site coordination, emergency assessment, and information collection and dissemination (United Nations, 2006, chapter C, p.5). An UNDAC team is a neutral, international asset that provides free of cost experienced emergency managers with varied skills to a sudden onset emergency. UNDAC staff and national experts can be called upon at very short notice (12-24 hours) anywhere in the world. An UNDAC team is self-sufficient in basic telecommunications, office and personal equipment (United Nations, 2006, chapter C, pp.1-2).

On-Site Operations Coordination Centre

In situations combining a high number of humanitarian actors and a rapidly evolving emergency situation requiring a high degree of coordination, the UNDAC team will set up an On-Site Operations Coordination Centre (OSOCC) for the coordination of the operational activities undertaken by humanitarian organizations responding to the emergency, including UN agencies, the government, and NGOs. The OSOCC is a clearly visible focal point and meeting place for interaction among the organizations carrying out or supporting the humanitarian response operation. To be effective, the OSOCC should be set up in the immediate aftermath of an emergency and before or simultaneously with the arrival of international relief resources (United Nations, 2006, chapter E, pp.6-7).

Information management in OSOCC

Information management is a core activity in UNDAC missions. In the UNDAC Field Handbook, the task of information management is defined as to "compile and analyze the information input from outside sources (…) and convert it into appropriate output format for dissemination to stakeholders" with the expected result of "provision of timely output of analyzed information in appropriate format" (United Nations, 2006, chapter E, p.18). In order to fulfill this task, UNDAC is supposed to define priority information requirements, collect the relevant information, collate, consolidate, organize, and analyze this information, make recommended courses of action for decision-makers, report and disseminate the findings and recommendations, and prepare regular situation reports (United Nations, 2006, chapter C, p.10).

TRIPLEX exercise

TRIPLEX is a biennial humanitarian exercise organized by the International Humanitarian Partnership (IHP), a voluntary international cooperation which provides support for international humanitarian operations. In September 2008 the TRIPLEX exercise took place during three days in the border area of Norway and Sweden.

TRIPLEX exercise description

The exercise was based on a floods scenario, which affected both Eastlandia and Westlandia – two countries which had been created for the purpose of the exercise. In reality, Westlandia corresponded to Østlandet region in Norway and Eastlandia corresponded to Värmland County in Sweden. Westlandia and Eastlandia were two very different countries: Westlandia was a medium developed and peaceful country with high involvement of international organizations, while Eastlandia was an autocratic and low development country, engaged in internal conflicts and generally hostile to foreign assistance. The area bordering Westlandia and Eastlandia was inhabited by Morokuliens, a minority and economically less-developed group in both countries. The scenario combined both seasonal flooding and flash flooding. TRIPLEX was organized as realistic as possible, with participants staying in an actual base camp and using vehicles and communication equipment as in an actual field operation. Moreover, Norwegian and Swedish municipalities were actively participating in the exercise by playing their role as local authorities and affected population.

UNDAC Mission

UNDAC's mission for TRIPLEX was defined as follows: "In view of the magnitude of the floods and the continued rains, the Government of Westlandia declared a State of Emergency for the Morokulien Region and requested international assistance. The UNDAC team was called upon to support the United Nations Country Team (UNCT) in Westlandia by providing technical services, principally in on-site coordination, information management and coordination of assessments. The team aimed to facilitate close coordination between the Westlandia Disaster Management Authority (WEDMA), the UNCT and the response in Morokulien. If requested, the UNDAC team would support the Government of Eastlandia (GoE) with assessment of situation and needs in the affected areas of Eastlandia and, if required, mobilize international humanitarian resources to assist GoE in their relief efforts."

RESEARCH METHODOLOGY

During the TRIPLEX exercise we were embedded in the Belgian First Aid and Support Team (B-FAST). The two authors and another B-FAST team member were delegated to join the UNDAC team as information managers in the OSOCC. Moreover, we had the task to evaluate the new joint needs assessment process that was tested in this exercise. Therefore we were working in the OSOCC and always present at the debriefings of the assessment teams. To get an accurate picture of the assessment process we also joined a team on the last day of the exercise to conduct an assessment. This gave us the chance not only to observe the phenomena we are interested in, "the fundamental base of all research methods in the social and behavioral sciences" (Angrosino, 2005), but to conduct a specific form of observation: participant observation (DeWalt and DeWalt, 2002). Participant observation originated in cultural anthropology and is now also a commonly used method in social sciences to "collect data in naturalistic settings" by researchers who "observe and/or take part in the common and uncommon activities of the people being studied" (DeWalt and DeWalt, 2002, p.2). By taking notes and pictures of our experiences, and studying various internal and external documents such as the UNDAC Handbook (United Nations, 2006), we can provide an accurate account of the information management activities that took place in the OSOCC and the needs assessment process outside of the OSOCC during TRIPLEX.

OBSERVATIONS

Information Management in the OSOCC

Both authors participated in the OSOCC by supporting the other three information managers: The first person was head of information management, the second person was in charge of gathering all incoming information, and the third person was in charge of disseminating information.

Drawing on our observations in the exercise and the study of the UNDAC Handbook (United Nations, 2006), we will now describe four important information management processes that took place in and around the OSOCC: information gathering, information presentation, information sharing, and information dissemination.

Information gathering

As the OSOCC is set up to coordinate the humanitarian assistance, the UNDAC team tries to be in contact with all the humanitarian organizations in the field. As soon as the OSOCC was set up, UNDAC set up a registration system for these organizations in order to find out which organizations were working in the area, who the contact person would be of the organization, to which cluster they would belong, and who the cluster lead should be. Whenever these organizations would have information that was relevant to the OSOCC, they would be able to visit or contact the OSOCC through telephone and e-mail.

There was one person in charge of gathering and documenting information from all possible sources, such as media, e-mail, internally shared information, information from humanitarian organizations, information from local authorities, information from the clusters, and information from the UN Resident Coordinator. However, the most important input of information for the OSOCC was the needs assessment process, which will be described further on. The OSOCC had a special communications room where people were constantly monitoring the radio traffic on the designated channels, especially when assessment teams went out to conduct an assessment.

Information sharing

All gathered information was shared through Microsoft Groove. Microsoft Groove, "Groove" in short, provides a platform with virtual workspaces through which groups of people can collaborate both online and offline. Groove enables people to work jointly on the same documents; information can be created, shared, and stored in workspaces, and people can communicate both synchronously and asynchronously. UNDAC uses Groove to ensure a structural approach to information management between and during missions, and as a tool for information exchange. UNDAC has developed standardized "UNDAC Mission Software" that functions as a reference for UNDAC teams in their missions, structured according to standard UNDAC functions. For this exercise a new mission-specific workspace was created based on the generic workspace.

During Triplex, UNDAC staff was working in Groove and sharing information on the work they were doing with the whole team. The designated information gatherer was continuously documenting the incoming information in Groove, scanning Groove for any updates in the folders, and making sure that the right people would get the information (which would mostly be the UNDAC staff in charge of the operations).

Besides this internal information sharing, UNDAC chaired general coordination meetings on a regular basis in which information was shared with the larger international community. Usually UNDAC would organize a meeting every morning and every evening with delegates from all international organizations. In these meetings the actual situation was discussed, and a plan of action was made on how to continue the relief. UNDAC also facilitated meetings with the cluster leads.

Information presentation

There were several ways in which UNDAC presented available information to visitors and to their own team members in order to facilitate the making sense of the situation. The OSOCC maintained a *log book* in Groove of all telephone and radio messages received or sent with action taken, which was updated by anyone who received or sent a message. UNDAC displayed *information maps* on a wall of the OSOCC which showed the area of the floods. Different types of information were indicated with post-it notes on the map displaying the most actual situation, such as the location of the assessment teams, key logistics features such as airfields and/or railway stations, and the security incidents in the area. The *contact details* were published next to the information maps, showing the phone numbers of people from the local authorities, UNDAC staff, team leaders from all humanitarian organizations, and the cluster leads. There was a screen projected on the wall with a *display of the email inbox*, so that all UNDAC staff could notice incoming emails. A so-called "*Pigeon hole*" was created, where hardcopies of the assessments, minutes of meetings, and all other incoming information was stored at a central location. UNDAC maintained a *directory* with a data sheet on each humanitarian agency, indicating their contact points and areas of operation. A *notice board* was placed just outside the OSOCC, on which relief organizations could leave notices regarding relief operations and coordination meetings, and on which UNDAC could display key information relevant to all organizations, such as a general meeting schedule and contact information of the cluster leads. Finally, UNDAC made sure that stakeholders could get *hardcopies* of the information available in the OSOCC, such as situation reports and contact-lists.

Information dissemination

UNDAC wrote reports on a daily basis in which the situation was described in a condensed form. Generally the situation reports would give a short overview of the current situation, the assessments that had been conducted, and the response that had been initiated. These situation reports were then distributed through Virtual OSOCC to the international community, which needed this information to make decisions on providing humanitarian assistance. Virtual OSOCC (http://ocha.unog.ch/virtualosocc/) is a web-based information platform on which disaster information is exchanged by relief actors working in all parts of the world. These relief actors continuously monitor Virtual OSOCC to find out the latest information on the disaster and to check which assistance is already provided and what is needed. One of the information managers in the OSOCC was continuously disseminating information through VOSOCC and scanning it for relevant information, such as relief planned by various organizations.

Needs Assessment Process

The UNDAC staff did not conduct assessments themselves, but coordinated the joint needs assessments that were conducted by NGOs, UN agencies, and other international responders. The focus in the exercise was on rapid initial assessments, which should help determine the extent of a disaster and its impact on the population as well as needs for international assistance during the immediate relief phase.

During the exercise usually five teams would go out to conduct an assessment each day, all to different locations, and each team would comprise around five people from different organizations. Teams would be equipped with fixed radio in their cars and standard assessment forms for each individual. Radios were mostly just used for security reasons; teams had to report their location at different time stamps, and could use the radio in case of an emergency. The assessment forms were structured according to seven different themes of information that had to be assessed at each location: demographics, health, water&sanitation&hygiene, food&nutrition, shelter&non-food items, protection, and logistics. Most of the teams assigned team members to one or two of these specific themes. The different team members would prepare themselves for the assessment by thoroughly reading through the questions in the relevant templates. When arriving at the disaster area, the assessment was mostly conducted by small groups of people, but each team member made sure that the team gathered information on their assigned sectors.

The rapid initial assessments were conducted through observation and semi-structured interviews. Observation gives a 'feel' for the situation through sounds, smells, and visual impressions. More specific information was obtained by interviewing survivors, representatives of the survivors, and key officials, and that information was cross-checked with observations. In this information gathering phase, the assessment teams would not consult the assessment forms but would ask for information with the questions in the back of their head while making notes on a notepad. After the information gathering phase – in the car and back at the camp site – the teams would discuss the situation, what they had observed and heard, and would fill in the assessment form stating the outcome of their discussion. UNDAC staff debriefed the assessment teams when they completed the form, and shared this vital information as quickly as possible with the other UNDAC members in the OSOCC.

DISCUSSION

We will now discuss how IS can support the seven resources for Sensemaking in the needs assessment process described previously.

Sensemaking's social context: Can IS encourage conversation?

Microsoft Groove supports conversation in the OSOCC, but conversation with assessment teams is not supported yet. If IS support real-time communication between the OSOCC and the assessment teams, the latter will be able to get important feedback on the situation and what to do, as the UNDAC staff has an overview of the situation as a whole. This will improve the assessment process: Teams get the latest information on disaster sites, affected people and the relief process, can get hints on other nearby areas to assess, and can much faster give important assessment findings back to the OSOCC.

Sensemaking's personal identity: Can IS give people a distinct, stable sense of who they are and what they represent?

Assessment team members and UNDAC staff all have their own identity, as they are working for various different organizations but are delegated to these teams when a disaster strikes. When they go out to a mission, and people from various organization form teams to conduct assessments, they change their identity. IS should support

assessment team members and people who communicate with them in the OSOCC to feel part of the same team with the same shared mission. This can be achieved when the assessment team members and people in the OSOCC use the same system; in this way, the teams will have the same defined identity.

Sensemaking's retrospect: Can IS preserve elapsed data and legitimate the use of those data?

After conducting the assessment individually, team members sit together to review what they saw and come to a shared assessment. However, there is a time gap between the actual assessment and the discussion and writing down of the final result. IS should help in capturing accurately what they assess, so they can review it whenever they need it: when constructing the final assessment by the team, and for transferring the assessment to the OSOCC. IS can assist this process by enabling digital capturing of information (e.g. pictures, digital notes instead of pen-and-paper ones), which will secure a faster and more accurate process.

Sensemaking's salient cues: Can IS enhance the visibility of cues?

IS can assist actors in focusing on cues by indicating which cues are important in a certain setting according to historical data. When assessment teams are able to review previous assessments, they have a point of reference and can compare it to their own situation. IS should enable the teams to indicate some key features of the disaster (such as type of disaster, climate characteristics, type of relief needed, etc.) to obtain best-practice advice on what to pay attention to in that type of situation. The same feature can be applied to the OSOCC: As UNDAC is now using Microsoft Groove in their missions, information from previous missions can be consulted. There is however no time to go through all documents of previous missions. Moreover, through an IS in which assessment teams and the OSOCC are connected, UNDAC staff can give on-the-spot advice on which cues to pay attention to as they have the overview of what is going on.

Sensemaking's ongoing projects: Can IS enable people to be resilient in the face of interruptions?

As assessment teams are literally "thrown into the middle of things and forced to act without the benefit of a stable sense of what is happening" (Weick, 1999), they should be supported in continuous updating of the situation in order to make their experience and actions seem ongoing rather than an interrupted series of events. Again, communication with the OSOCC is important in this since it enables assessment teams to be continuously updated on the situation in the disaster area, giving them a stable sense of what is going on.

Sensemaking's plausibility: Can IS encourage people to accumulate and exchange plausible accounts?

The focus in the assessment process is now too much on probability than on possibility. Assessment team members make observations at a disaster site and conduct interviews, then negotiate their points of view with each other, only after that – when the most accurate picture is crafted – to communicate an assessment with the OSOCC. IS should again stimulate reflection in earlier stages of the assessment process between OSOCC and assessment team, in which the assessment team members report a plausible account of what is going on, and on which the OSOCC can give relevant feedback.

Sensemaking's enactment: Can IS encourage action?

IS should stimulate action as a means of gaining more understanding of the situation. As we have seen in the previous discussion, IS can support various types of actions in these processes. Examples of action taken by assessment teams are interaction on what is going on and exchange of plausible accounts. The UNDAC people working in the OSOCC act when they actively engage in the assessment process and share their interpretation of the situation.

CONCLUSION

When assessing the severity of a disaster and the relief that is needed, people face problems of ambiguity and equivocality. Sensemaking describes the resources that influence how well people can handle these problems, which can be a starting point for designing supporting IS. Through participant observation we could give an insider's perspective of the UN information management process and the needs assessment process in the TRIPLEX humanitarian disaster response exercise. We have indicated various opportunities for IS to support the making sense of the situation. The most important finding is that IS should connect both the assessment teams and the information managers in the OSOCC in real-time. This will encourage conversation, support a defined identity, enhance the visibility of cues, enable resilience, encourage exchange of plausible accounts, and encourage action.

Although these findings are just indications and based on the authors' observations in an exercise situation, they show that IS support for Sensemaking is possible in these situations, and are a starting point for further more rigorous research in a real-life setting.

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