The importance of a common understanding in emergency management

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ABSTRACT

An emergency situation brings together individuals belonging to many different organizations, representing different organizational cultures including different usage of language. In this paper we propose that a common understanding is vital in managing emergency situations. Firstly, a simple emergency situation is presented where one of the causes for increased damage was simply due to a misunderstanding of language. Secondly, we propose a theoretical framework of how different organization cultures with their different uses of language can be integrated on the terminological level where the communication takes place. Thirdly, the presented example is reviewed. We show how situations such as the one in our example can be analyzed by means of the theoretical framework. Finally, we present the findings from a Delphi study conducted in Finland, which support the central thesis, i.e. the importance of a common understanding in emergency situations, and we propose using the Delphi method to find the critical domains in the flow of information between the different actors involved in disaster management.

1. Introduction

An emergency situation can be caused either by natural forces or by human activities. Usually it will bring together individuals belonging to many different organizations who represent different organization cultures that may differ in their communication. In this context, terminological differences also play a decisive role. Depending on the individual structures and practices of the respective organizations, different terms are used, which can cause several communicational issues [1]. The basis of reconciliation is that the different parties involved understand each other, particularly in a disaster scenario. In order to improve emergency management it is essential to anticipate and be ready for cross-sectoral collaboration with different organizations and different fields of operation.

In many emergency situations related to disasters, especially in man-made disasters, the first responders in the situation are typically company personnel. Therefore their appropriate action in the situation is very significant. It is crucial that these personnel can communicate and act as effectively as possible in an acute situation. Accordingly, one of the major communicational challenges related to disasters is that, since company personnel and other civilians are not professionals in the security or rescue field, their communication abilities may be limited. In addition, communication problems are a common occurrence where actors communicate across organizational boundaries [2].

It is typical of disasters that they cannot be managed by an organization on daily-based preparedness and resources alone. It is important to be aware of what has happened, what is likely to happen, and the consequences of the incident in terms of disaster management. It also has to be possible to form a concept of how damage and threats caused by an accident can be prevented and mitigated as effectively as possible [3,4]. Therefore learning and understanding what actually happened before, during, and after a crisis is also extremely important for improving the response processes [5,6].

Communication plays a key role in serious accidents, see e.g. [7,8]. The Chair of the Accident Investigation Board of

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Finland, Veli-Pekka Nurmi, has commented on this point as follows: "The situation in a disaster is never so bad that poor communication and flow of information cannot change things for the worse" [9].

Although the concept of an emergency is quite clear, there are many definitions of a disaster. In this paper we treat the concept of disaster as synonymous with a major accident, referring to an accident that is considered to be especially serious because of the number of killed or injured, damage to the environment or property, or the nature of the accident [10]. A disaster may be for example:

- A nuclear disaster in a country or in a certain vicinity.
- A severe disaster involving hazardous materials.
- An earthquake or a storm causing severe damage.
- A major disruption in the supply of energy.
- An explosion, fire or other severe incident or accident.
- A major aviation accident.
- A railway accident involving passenger transportation or a major traffic accident.
- A serious accident involving a passenger ship [10,11].

When dealing with disasters, heterogeneity is ubiquitous in emergency management informatics and emergency situations are characterized by their complexity and the diversity of the available information [12,13]. There are various names for entities, process rules, sensor platforms, information systems platforms, data and communication formats, organizations, and even languages. Such heterogeneity can hinder an effective disaster response, which was clearly seen in Haiti following the 2009 earthquake. As proposed by Galton and Worboys, an ontology that can provide unified definitions of entities, their properties and relationships, and thus facilitate improved communication in the presence of heterogeneity, would be one solution to this problem [12]. Emergency managers need to make decisions, often with important consequences, despite stress and time pressure. To implement adequate mitigation measures, emergency managers must make sense of the situation even though information may be lacking, uncertain or conflicting. Additionally, emergency managers are confronted with redundant or irrelevant information causing information overload [13].

It is important to note that disasters always involve the interaction of physical extremes (perhaps tempered by human negligence or carelessness) with human systems. There is not always a proportionate relationship between the size of the physical forces unleashed and the magnitude of the human suffering and losses that result. Chains of adverse circumstances or coincidences can turn small physical events into large disasters, see Fig. 1. [14].

The tsunami that occurred in the Indian Ocean after the earthquake in 2004, the earthquake of Sendai and the subsequent tsunami, and the nuclear disasters of Fukushima in 2011 are examples of emergency disasters of enormous scale (Arrow 1 in Fig. 1). If a minor earthquake causes an unstable bridge to collapse, the consequences will be different if the bridge is unoccupied (Arrow 4) or if vehicles or people are on it (Arrow 3). On the other hand, a major earthquake in the middle of a desert far from human civilization may have minor consequences (Arrow 2). However, a minor physical event can also lead to a major disaster if circumstances combine unfavorably in emergency management for instance as a result
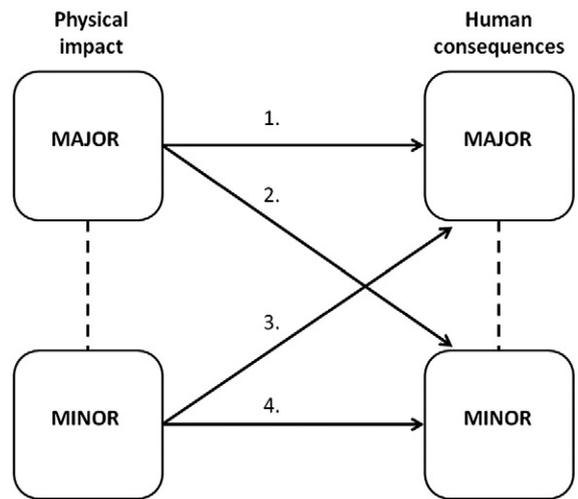

Fig. 1. Relations between physical impact and human consequences of disasters.

of human misunderstandings, which is the issue highlighted in this paper (Arrow 3).

Given that at least some disasters tend to be repetitive events, a cycle may be formed that can be divided into the phases of mitigation, preparedness, response, and recovery including reconstruction; see Fig. 2 [14]. The first two phases occur before the accident and the last two afterwards.

- Prevention & mitigation comprise actions designed to reduce the impact of future disasters (e.g. land-use planning and evacuation planning).
- *Preparation* here refers to actions taken to reduce the impact of disasters when they are forecast or imminent (e.g. execution of evacuation).
- *Response* refers to emergency actions taken both during the impact of a disaster and the short-term aftermath (e.g. safeguarding human lives and actions of the fire service).
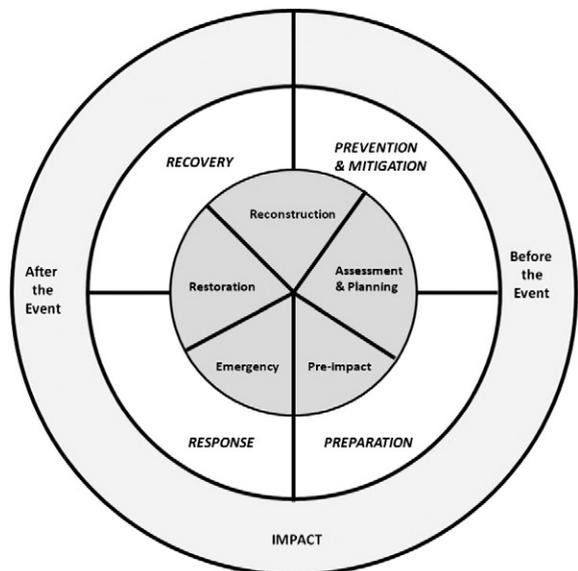

Fig. 2. The four phases of emergency management.