SELECTION OF PANELISTS FOR A DELPHI SURVEY ON EMERGENCY PREPAREDNESS AND MANAGEMENT

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ABSTRACT

In emergency situations a group of individuals representing different organizations, for example authorities and companies, have to work together. They have to absorb a large amount of information about the disaster over a short period of time. In order to be able to make the right decisions, individuals need to understand each other even though they may be from different lines of business. In our research, the target is to stress the importance of a common language in emergency management. Our plan is to gather a group of experts to communicate with the Delphi method on possible differences in the terminology used in different lines of business. Experts from the authorities and from the business life as well as from voluntary rescue organizations will be invited onto our Delphi panel. The aim of this paper is to evaluate which kind of organizations and which kind of expertise would be the most valuable for our Delphi study, the objective of which is to improve the interoperability of organizations' management and communications systems in emergency situations.

Keywords: Delphi, Emergency Preparedness and Management, Interoperability of Organizations

I. INTRODUCTION

We have to be prepared for possible emergencies and disasters at different levels of society, whether they are caused by the actions of a human being or by the forces of nature. Examples of major emergencies and disasters include the New York terror attacks in September 2011, the tsunami that happened in the Indian Ocean after an earthquake in 2004, the Sendai earthquake and the ensuing tsunami, and the nuclear disasters of Fukushima in 2011. In these disasters, communication was a crucial issue in the organization of the rescue actions.

The concept of disaster has several definitions. Castrén et al. [3] define it as follows: "By a disaster we mean an incident, which is severe based on the amount of victims or the quality of injuries or based on the damage to/of environment and property".

A disaster or a natural catastrophe may be for example:

- A nuclear disaster in a country or in a certain vicinity
- A severe disaster involving hazardous materials
- Storms or frosts causing severe damage

- Major disruption in the supply of energy, for example during exceptional weather conditions
- An explosion, fire or another severe incident or accident
- A major aviation accident
- A railway accident concerning public transportation or a major traffic accident
- A serious accident involving a passenger ship [e.g. 3, 15].

The world is changing: public sector, economic life, and civil societies and their structures are all changing. Globalization, the network economy, and technological development have changed our outlook and modes of operation [16]. This new kind of awareness of disaster situations requires better integration of public and private sectors [20].

One of the starting points for this integration is that the different actors should understand each other. The Director of the Accident Investigation Board of Finland, Dr. Veli-Pekka Nurmi, says: "The situation in a disaster is never so bad that things couldn't be made worse by weak communication and the poor flow of information," [17].

In the ongoing SAVE research project, our aim is to bring together the authorities of different administrative sectors, corporate experts as well as voluntary organizations with the Delphi process to give their views and their development ideas concerning the potential challenges in communication in relation to emergency preparedness and management.

II. ON EMERGENCY PREPAREDNESS AND MANAGEMENT

It is typical of disasters that they cannot be managed by an organization on daily-based preparation and resources alone. It is important to be aware of what has happened and what will probably happen and what the consequences of the incident are in terms of disaster management. It also has to be possible to form a concept of how the damage and threats caused by an accident can be prevented and mitigated as effectively as possible. [11, 21.] In emergency management, the main processes are:

- Preparedness (analysis, planning, and evaluation)
- Training
- Mitigation
- Detection
- Response
- Recovery/Normalization

These processes are cyclical and overlapping, requiring collaborative participation, and the involvement of diverse expertise and organizational units. [e.g. 1, 25.]

Information connected with a place and time and in which the situation is described as reasonably as possible (using an image, voice, text, etc.) in order to know what has happened or is happening and which persons or objects the incidents may concern, is called situation awareness [11]. Clear situation awareness is a key factor for the effectiveness of emergency operations. Situation awareness is based on the compilation of information collected from the different teams of responders. The building up of such a picture relies on the exchange of information [18]. Decision-making on the management of disasters can be simplified to find the answer to the following questions:

1. What has happened and what is happening?
   a. To whom and to which objects?
   b. Where and when?
   c. Why?
2. What should be done now (and next)?
   a. When?
   b. Where?
   c. By whom?
   d. What must not happen?
3. How can we collect the necessary resources available to do that?
   a. When?
   b. Where?
   c. By whom?

Several different versions of situation awareness concerning the same situation may be needed for different agents [7]. Kuusisto reports clearly the challenges caused by the parties taking care of different tasks, by the organization cultures, and division of responsibility areas. The content of the information required for situation awareness varies during a disaster but also depends on the level of tasks in hand. Fig. 1 illustrates the three main levels of tasks of authorities at a large-scale fire accident [18].

Figure 1. Levels of tasks of emergency management

The tactical functions *cover the immediate response and the longer-term clean-up activities at the location of the disaster management. Tactical control commands the securing of the disaster area, provides e.g. the immediate fire fighting activities and the initiation of the search and rescue tasks. Triage and*

treatment of casualties are undertaken at the location. Special response teams, including immediate decontamination and environmental teams, work at the tactical level.

The operational functions *cover the supporting activities to ensure that the tactical operations are coordinated and executed effectively and with consideration to prioritization, efficiency, and safety. The operational functions also include co-ordination activities and the dissemination of information to the tactical teams, as well as providing briefings to the media. The operational functions co-ordinate hospital services, compile casualty figures and deal with evacuees from the disaster area. Collection of information and evidence is also facilitated by these functions.*

The strategic functions *are focused on the overall higher-level co-ordination of the disaster rather than the lower-level functions of the other control commands. The strategic functions include the longer-term activities, such as the formation of strategy, the assessment of environmental impact, public health concerns, and longer-term recovery measures. The strategic functions include interaction with government and other high-level bodies. Cost accounting and financial provision are included in the strategic remit.* [18.]

For various reasons, although the object domain is the same, different authorities or companies specialized in their own fields use different concepts and terms for the same issue (Fig. 2). Some of those differences may be explained by cultural differences as well as differences in organizational cultures [e.g. 2, 5, 12]. There may also be other possible reasons, which our research aims to find out. We use Finland as an example country as shown, for example, in the titles of the authorities or in different legal structures. Although the social and legal systems are different, we believe that the research results can be generalized internationally.

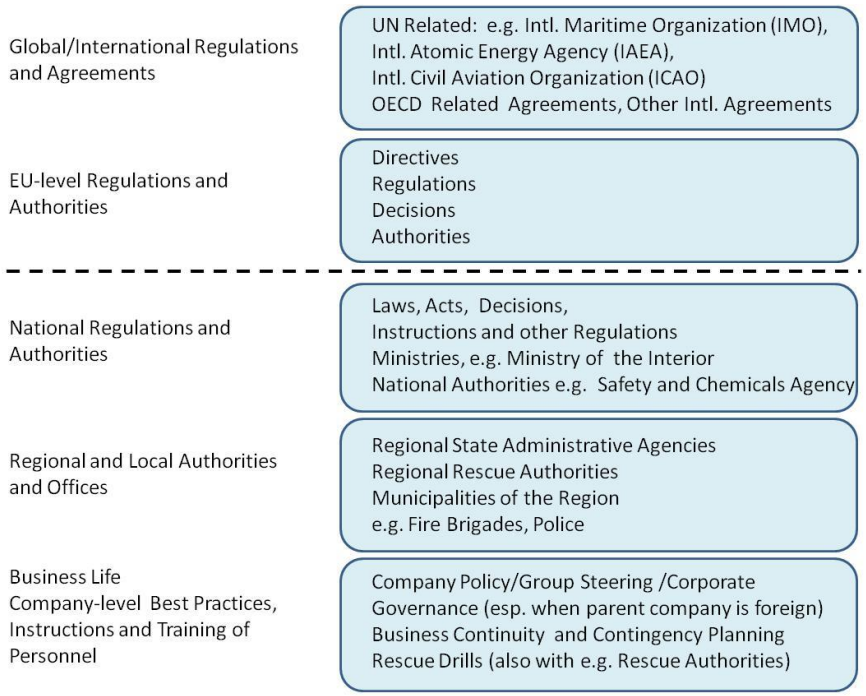


Figure 2. Emergency/Disaster Preparedness and Management: Regulations, Agreements and Actors

Communication between the actors involved has a key role in emergency management. Figure 2 illustrates the situation in Finland:

1. There are several levels of regulations and agreements that have to be followed, all of which use terminology that is not necessarily the same as that used by others.
2. There are several authorities that have to be able share information with each other and with companies.
3. There are companies that may cause a possible disaster or where a possible disaster may happen.

These regulations, actors, and various lines of business may have different terminologies and concepts and ways of doing things. However, the common goals of the authorities and companies are to guarantee the security of personnel and other people and in addition to prevent or minimize material damage and to help recover the functioning of society.

III. DELPHI PROCESS

A. Research settings

The overall objective of our research is to produce new knowledge of emergency preparedness and management for authorities and the business sector. The aim is to study the issue by using Delphi to identify circumstances where different actors have recognized potential problems or risk situations related to the flow of information and communication. This will allow us to create an overall picture of challenges in the flow of information and communications in disasters.

The aim is to:

1. Identify situations where there have been challenges or problems related to information flow in or between different organizations.
2. Identify problem situations in different action phases. What are the challenges in the pre-accident preparedness phase, and on the other hand, what are the challenges in actual disaster situations?
3. Obtain development proposals for preparedness planning and action plans. How can risk management and action plans be developed so as to prevent or minimize all damage? How is it possible to develop accident management by means of education and training?

This knowledge can be utilized in the development of preparedness as well as in personnel education and training. This new knowledge can also be used in actions related to actual disaster situations where the role of collaboration is significant, so that all damage can be prevented or minimized more effectively for:

- Companies
- Personnel
- Authorities, as well as the
- Environment and society.

The results will help e.g. when improving the interoperability of management and communications systems. This research project will also facilitate better situation awareness for use in accident/disaster planning and management.

B. Delphi method

Delphi is a survey or an interview method in which experts' knowledge and presumptions on the issue or the development process under study are collected in an interactive process. As a data collection method, Delphi falls into the category of both a quantitative and a qualitative study. Delphi is especially useful when the phenomenon under study is complex or when the topic is somehow delicate – difficult to define, awkward to talk about, politically sensitive, etc. [e.g. 9, 14].

There are several objectives that indicate the use of Delphi in our research. Delphi is a suitable research method e.g. when a) Exploring underlying assumptions or information leading to different judgments, b) Allowing exchange of tacit knowledge among professionals, c) Seeking out information which may generate a consensus on the part of the respondent group, d) Correlating informed judgments on a topic spanning a wide range of disciplines, and e) Educating the respondent group on diverse and interrelated aspects of the topic [14, 25].

C. Iteration and feedback

The Delphi method differs from ordinary surveys in the way iteration and feedback are used. Opinions are not only collected for analysis as in Gallup-type surveys, but information on the answers will be fed back to the panelists for comments and/or as a basis for the next round. With the help of this feedback, the respondents are obliged to give grounds for their choices. It is essential for the Delphi process to build up information, which proceeds round by round so that the previous round forms the basis for the next one [e.g. 9, 14].

D. Selection of the Delphi panel and anonymity of panelists

One of the most critical phases of a Delphi study, according to many Delphi practitioners, is the selection of experts for the panel. The Delphi is well suited for setting up a communication structure among members who possess the same general core of knowledge and who are already well informed. The successful realization of Delphi also requires the design of a panel structure that allows many knowledgeable individuals from different disciplines or specialties, who have a different working background and experience, and who contribute information or judgments on the problem area which is much broader in scope than the knowledge that any single individual can possess. [e.g. 4,6,14.]

In our research, we are going to build a Delphi panel of around 35 people [19]. The objective is for about 15 of the experts to be representatives from various authorities, 15 from the business world with backgrounds in different lines of business, and 5 from voluntary rescue organizations (Fig. 3).

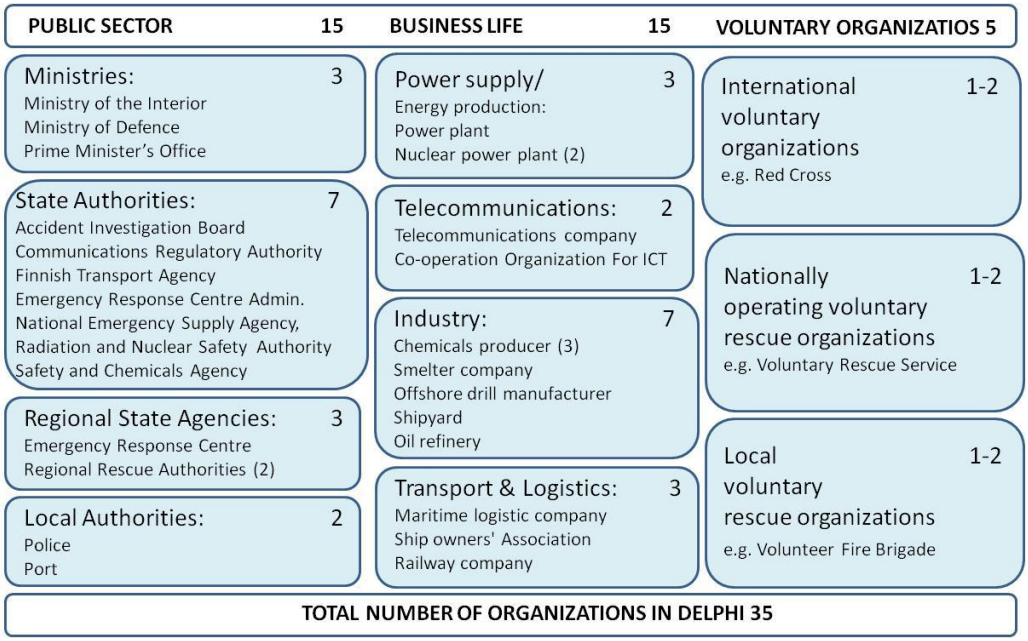


Figure 3. Organizations represented on the Delphi panel

From the public sector we will invite representatives from:

- 2-3 Ministries; ministries that are e.g. responsible for policy making and development of legislation and other regulations concerning the topic of this research
- 9-10 State/Regional State Authorities
- 2-4 Local/Municipal Authorities.

From business life we will invite representatives from:

- 4-5 Power/energy supply and telecommunications providers including a nuclear power plant
- 6-9 Companies, including chemicals production
- 2-3 Companies representing transportation, including hazardous materials transportation (Fig. 2).

We also are going to select around five voluntary rescue organizations to be represented on the panel:

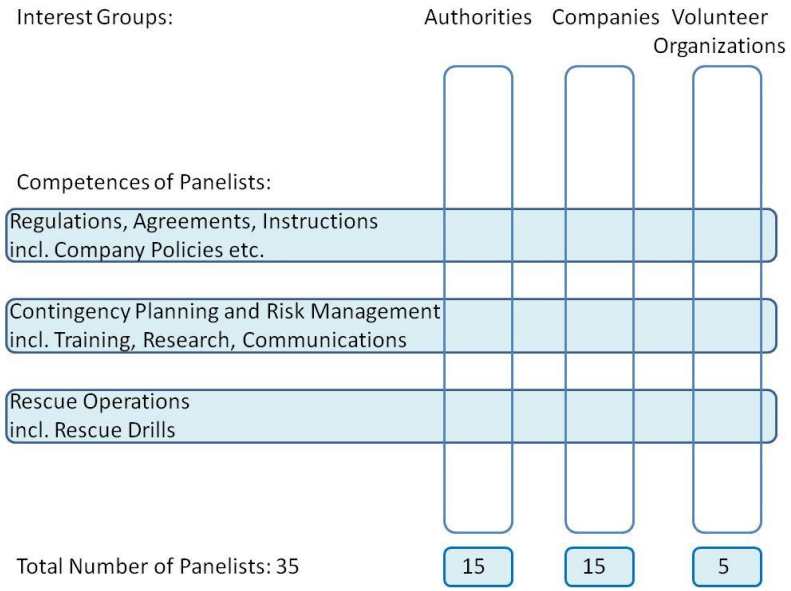
- Internationally operating rescue organizations.
- Nationally operating rescue organizations
- Local rescue organizations.

We have considered that panelists should have personal competencies and working experience covering:

- Overall regulations and agreements in the field of emergencies
- Contingency planning
- Rescue operations.

As a result, from the organizations represented and the competencies of the individuals selected for the panel, we hope to cover the following Interest Group-Competence matrix (Table 1):

Table 1. Interest Group-Competence Matrix of the Delphi Panel



Presently we are at the stage where we have identified the organizations from which we would like to have experts for our panel and what kind of expertise the panelists are expected to possess. In this Delphi application, the complete anonymity of the panelists is considered unnecessary [22, 24]. At the beginning of the first Delphi round, the panelists will be given the names of all the other participating panelists. However, the individual answers and arguments will be anonymous. We will call this arrangement *semi-anonymity*.

E. Delphi rounds

The first Delphi round will be accomplished by means of recorded interviews. All 35 panelists will be interviewed personally in the first half of 2012. We are planning to use semi-structured interviews allowing interviewees the possibility to express their opinions on the research subject freely but keeping them on the right track. The interviews will be recorded, transcribed, documented, and then analyzed. Through personal contact with the panelists, we also hope to increase the commitment of the panelists for the next rounds [8, 9, 13].

The target of the first Delphi round is to find out what kinds of challenges or problems the panelists have encountered concerning emergency preparedness or disaster management. Interim Report 1 will be created and distributed to the panelists before the next Delphi round.

The second and third Delphi rounds will be carried out using Internet-based Delphi software [10, 24]. The second Delphi round will take place in late 2012. Questions and claims for the Internet-based questionnaire will be formulated based on the desk study and information from authentic interviews and Interim Report 1.

The focus of the second Delphi round is to concentrate on finding the reasons for possible challenges and problems in communication. Are they perhaps due to regulations or agreements or just practices in a certain line of business? Interim Report 2 will be created and distributed to the panelists before the last Delphi round.

The third Delphi round will take place in the first half of 2013. We will use it to try to find the solutions for possible problems in communication and to create suggestions to be used by the authorities and companies involved. The release of the final results of the research will be at the end of 2013.

IV. SUMMARY

The importance of co-operation in emergency management and business continuity planning need to become better recognized both in industry and government. Although, according to regulations, rescue authorities are responsible for direct rescue operations at the accident site, in disaster situations society relies increasingly on help from outsiders. In many emergency situations, the first responders in the situation are typically company personnel. Therefore, it is important that they are able to take appropriate actions in the situation. It is crucial that these employees can communicate and act as effectively as possible in an acute situation. One of the major communicational challenges related to disasters is that company personnel and other civilians are not professionals in the field of security or rescue.

The objective of the ongoing SAVE research project is to bring the authorities and representatives of business life together so that they are able to share their experiences and knowledge on the potential challenges or problems concerning communication, especially when it comes to concepts and terminological issues. We also target the identification of situations where there have been challenges or problems related to the information flow in or between different organizations.

The aim of the research is to bring new knowledge on emergency preparedness and disaster management to the authorities and the business sector. The workflow (Fig. 4) of our research has begun with a desk study of current regulations and finding out which authorities are responsible for which kinds of emergency situations. Then, during 2012 and 2013, we will carry out a three-round iterative Delphi study with around 35 experts.

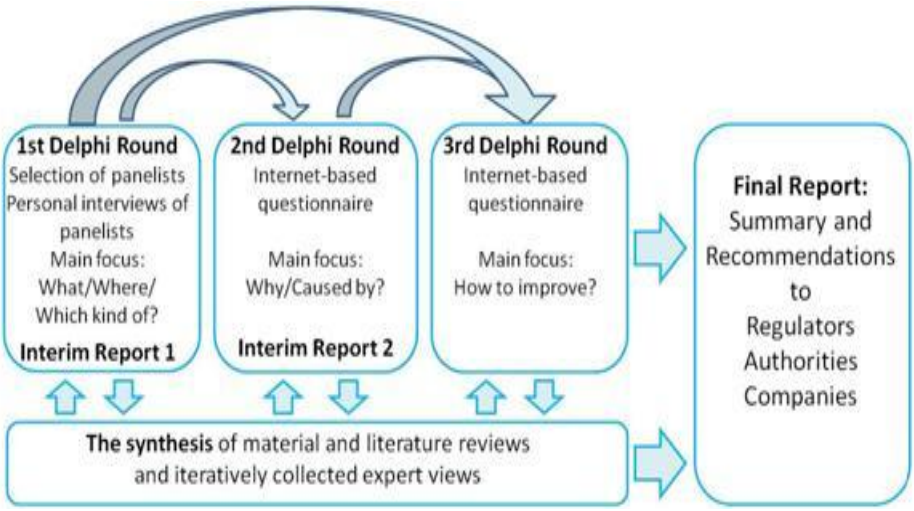


Figure 4. Workflow of the Research

Even though the focus is on disasters caused by/in business life in our research, we also expect the results to be utilized on other occasions demanding interaction between these actors. We hope that the results of our research will be useful, for example when

improving the interoperability of management and communications systems, and also when developing regulative actions and planning personnel training.

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