



ELITE

Elicit to Learn Crucial Post-Crisis Lessons

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Learning Process Framework for Post Crisis Management

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EXECUTIVE SUMMARY

The *Elicit to Learn Crucial Post-Crisis Lessons* (ELITE) project has developed a living document containing lessons learned from disasters such as forest fires, earthquakes and floods, in particular the project focused on identifying learned that are common across these disaster types. The ELITE living document is a publicly available web solution which comprises a “living” repository of best practices and guidelines as well as social media features. The living document has become part of a socio-technical framework for learning post crisis for a community of practice (COP). This deliverable 5.4 is a compilation of deliverables 5.1, 5.2 and 5.3 and describes a socio-technical learning process framework for post crisis management. .

This report contains:

1. A summary of the learning process identified in the community of practice
2. Reflections and analysis of the learning process observed in community of practice.
3. A list of evaluations criteria for post crisis learning practice
4. A description of a holistic socio-technical framework for post crisis learning.
5. Major contributions
6. A learning process Framework for Post Crisis Management

1. INTRODUCTION

The overarching goal of the ELITE project is to improve European emergency preparedness, response and recovery from disasters. ELITE is short for Elicit to Learn Crucial Post-Crisis Lessons. In an ideal world, individuals and organization should learn from their mistakes and failures and be able to share these lessons learned with other individuals and organizations. However for this to occur on a regular and systematic basis, a learning process needs to be in place and managed. The goal of this report is to outline a socio-technical learning process framework that that can be used to improve emergency preparedness, response and recovery from disasters.

1.1 Outline of the report

Learning is complex. Learning from post disaster and crisis management events is extremely complex. Modeling is one of the techniques used by individuals and organizations to deal with and manage complexity. In this report we present a socio-technical model of a learning process for post crisis management which was constructed and validated after holding 4 table-top workshops on forest fires, earthquakes, floods and a holistic one. The report is divided into 4 sections. First a brief review of the literature about learning processes will be presented. In the next section the socio-technical modeling approach which is the basis for the framework will be outlined along with the explanation of the learning measuring points. In the next section evaluations criteria to measure and manage the learning process will be listed.

2. LITERATURE REVIEW LEARNING PROCESS

In the crisis management literature there are different ways to define and model, and operationalize learning and learning mechanisms [2,3]. In order to be able to operationalize the concept some authors, like Dixon [4] argue that learning must be distinguished between “individual learning” and “organizational learning”. Dixon [4] defines organizational learning as the “intentional use of learning processes at the individual, group and system level continuously to transform the organization in a direction that is increasingly satisfying for its stakeholders”. The organizational learning process is described by the following four steps; (1) Acquisition of knowledge, (2) sharing of knowledge, (3) constructing meaning, (4) organizational memory [4].

Other authors such as Sommer et al.[2] have designed learning models that place the “individual at the center of attention and focuses on the individual’s need to learn”. Sommer et al. also includes contextual elements in their model, such as skills, knowledge and problem solving abilities. Their model of learning in emergency response work is based on a “combination the socio-cultural approach to learning (learning as participation) and the individual cognitive approach to learning (learning as acquisition)” [2]. Learning as acquisition focuses on “individuals as learners where learning is understood as acquisition of information and reasonable behavior” [2]. While learning as participation focuses on “social relations between people rather than on the individual in isolation” (ibid). These two aspects are combined in order to capture the whole reality in which learning occurs for emergency response workers [5]. Sommer et al. [2] highlighted that one has become aware that the performance of responders in the response phase of a crisis is often inadequate and that there is limited learning. It is in this context essential to have basic organisational prerequisites in order to *effectively learn from failures*. This includes factors such as mutual trust between the responders within the organization, participation in operations, exercises, evaluations and knowledge of possible learning mechanisms [5].

Other authors do not explicitly distinguish between individual and organizational learning, but rather on the type of learning. For example, some of the most prominent authors within the study of crisis management, Boin, Hart and Sundelius, introduce three different types of learning:

(i) *Explanation based learning* is when one has a “rational-scientific search for the causes of failure and the effect of response» [3]. An example is that in the aftermath of the crisis, a committee of scientists and professionals is created to try to find out what was the cause of the crisis. The committee review how the crisis management and response teams worked in practice. This type of learning requires independence from political pressures [3].

(ii) *Competence or skill based learning* implies that during and after the crisis new expertise and technology is created to handle a similar crisis in the future in a better manner. This means that one detects a knowledge gap in specific areas. An example from Norway is from the swine flu pandemic in 2009 where it was necessary for health

professionals to learn about new technologies and acquire new skills in order to deal with the pandemic.

(iii) *Experiential learning* is when one has experienced direct exposure to a crisis and has subsequently developed insights about what caused the crisis and how the crisis management worked. Boin et al. believes that it is to "translate memories into lessons" [5]. This type of learning occurs most often with people who work with handling different types of emergencies and who follow contingency plans or Standard Operating Procedures (SOP). This experience makes it easier to compare different types of emergencies and ways to manage a crisis situation. There are few public managers who have experienced multiple crises, and their personal experience is often limited. However, the other two types of learning can be argued to be more indirect forms of learning [5].

Organizations must embrace the opportunity to acquire new knowledge emerging from a crisis. However, there are barriers to learning that inhibit organizations from seeing signals in time to prevent crisis or to respond in the best possible way. The learning style of the organization will influence the action taken. Improved systems of evaluation "may help to spot emerging vulnerabilities before it is too late" [5]. Systems of evaluation and post crisis learning might improve the organization's capability to prevent, prepare and respond to new crisis. In three workshops in 2013 best practices and different ways of improving lessons learned after crisis have been discussed among the members of the ELITE Community of Practice. The scope of all workshops was to identify the most important learning points in the three phases of a crisis [6,7,8]. It was argued that learning in the post-crisis phase is essential for increasing detection, prevention and preparation in the pre-crisis phase, hence that the phases must form a circle. If the organization has learned from a crisis, the organization should be able to prepare and assess a potential crisis differently than before the last crisis, as a result of the experience gained from the former [9,10].

After a crisis the different actors involved should begin evaluating what has happened, in order to learn from the crisis and be better prepared when the next incidents occurs. The actor/organization can act differently when processing the knowledge they possess. Apart from understanding who learns, another important question is what has been learned? Argyris and Schön [11] explained the concepts of single, double and triple loop learning. Swieringa and Wierdsma [12] use these concepts to explain that there are three different kinds of learning. The first loop is about "what to do", about following the rules and implementing small changes to a specific practice or procedure. It is a type of learning that involves "detecting and correcting deviations and variances from standards" [13]. The second loop is "learning what to do", it is about insights, sorting out why something works and subsequently changing the rules. To achieve double-loop learning the organization must move beyond procedures and reflect on the appropriateness of the underlying structures and practices and reflect on how they can be redesigned or fixed. Finally, the third loop is recognized as the highest form of organizational learning and is about "learning how to learn". This form of learning creates shifts in understanding our ways of learning and involves reflections on why we want to do what we are doing. This involves self-examination, which can be done through debriefing, analyzing and acting on the lessons identified. If the organization reflects and questions inconsistencies in crisis management and lessons identified after

crises, the knowledge gained can be fed into real changes on the ground or transform the internal structure, culture and practices in the organization. “When learning is characterized by reflection and actions that address the conditions that structure interaction patterns in single and double loop learning, it is referred to as *triple loop learning*, i.e., learning to learn”[14].

As Harnesk points out, crisis management systems as socio-technical systems has not been well researched [15]. However, the extended information dependent crisis actor network, grounded in the hierarchy structure of crisis organizations, demands other plausible design premises than that of traditional decision science. The foremost reason is that crises are complex socio-technical environments to manage and control because they concretize discontinuity as the rule, and continuity as the exception, and crisis information systems has primary been designed according to the exception.

To the authors' knowledge this is the first attempt to model the learning process in a crisis management system as a socio-technical system.

3. A SOCIO-TECHNICAL MODEL

The socio-technical modeling approach used here is a modeling approach that has been used to predict the likelihood of adopting new security technologies [17]. This modeling approach was chosen because the use of the technology of living documents of lessons learned is, to some extent, a technology not yet adopted by the community of practice that was the focus of the ELITE project.

The approach is a multi-level model that looks at the adoption problems from the individual, organizational, national and international level. The model shown in figure 1 starts by a simple model of social systems and divide them into: (1) culture systems; which are described as a distribution of values, (2) structural systems; which are described as distributions of power and or authority. The technological systems are divided into two concepts of (3) machines and (4) methods and process. In order for any new process or machine to be adopted at any level of socio-technical systems all four components must interact efficiently.

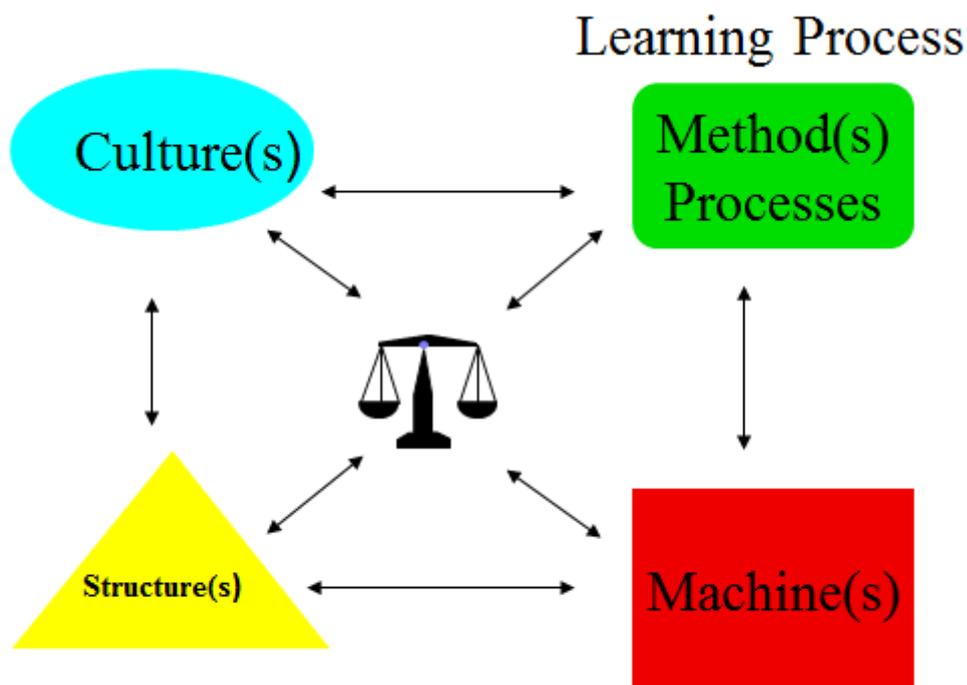


Figure 1: Ideal Social Technical Systems accepting new “learning process”

Not only must all four components of a socio-technical system interact efficiently, if the socio-technical systems at a level above or below are in conflict with a socio-technical system at another level, adoption or change will be hindered (See figures 2 and 3).

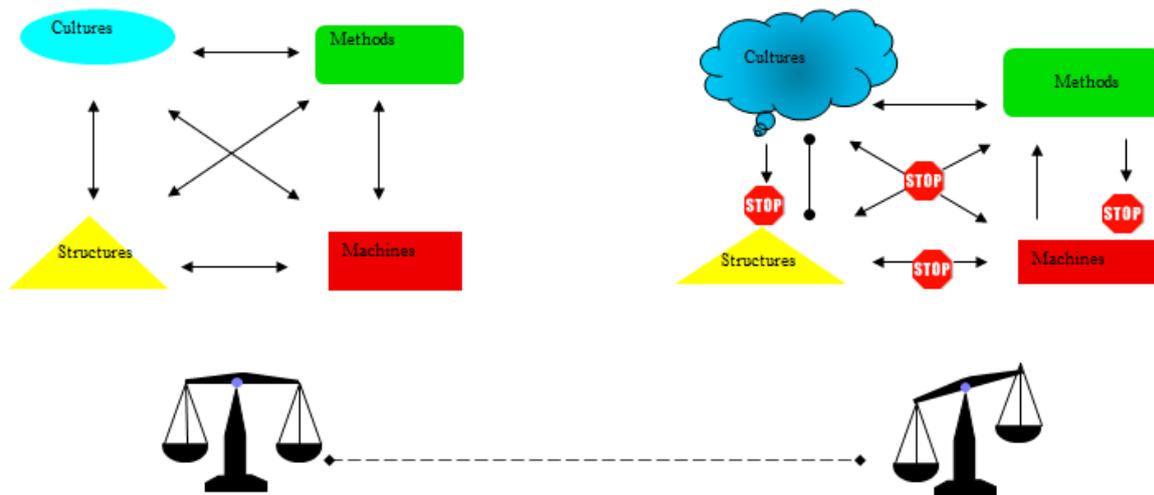


Figure 2: Socio-technical model of Functional and Dysfunctional Learning in a Community

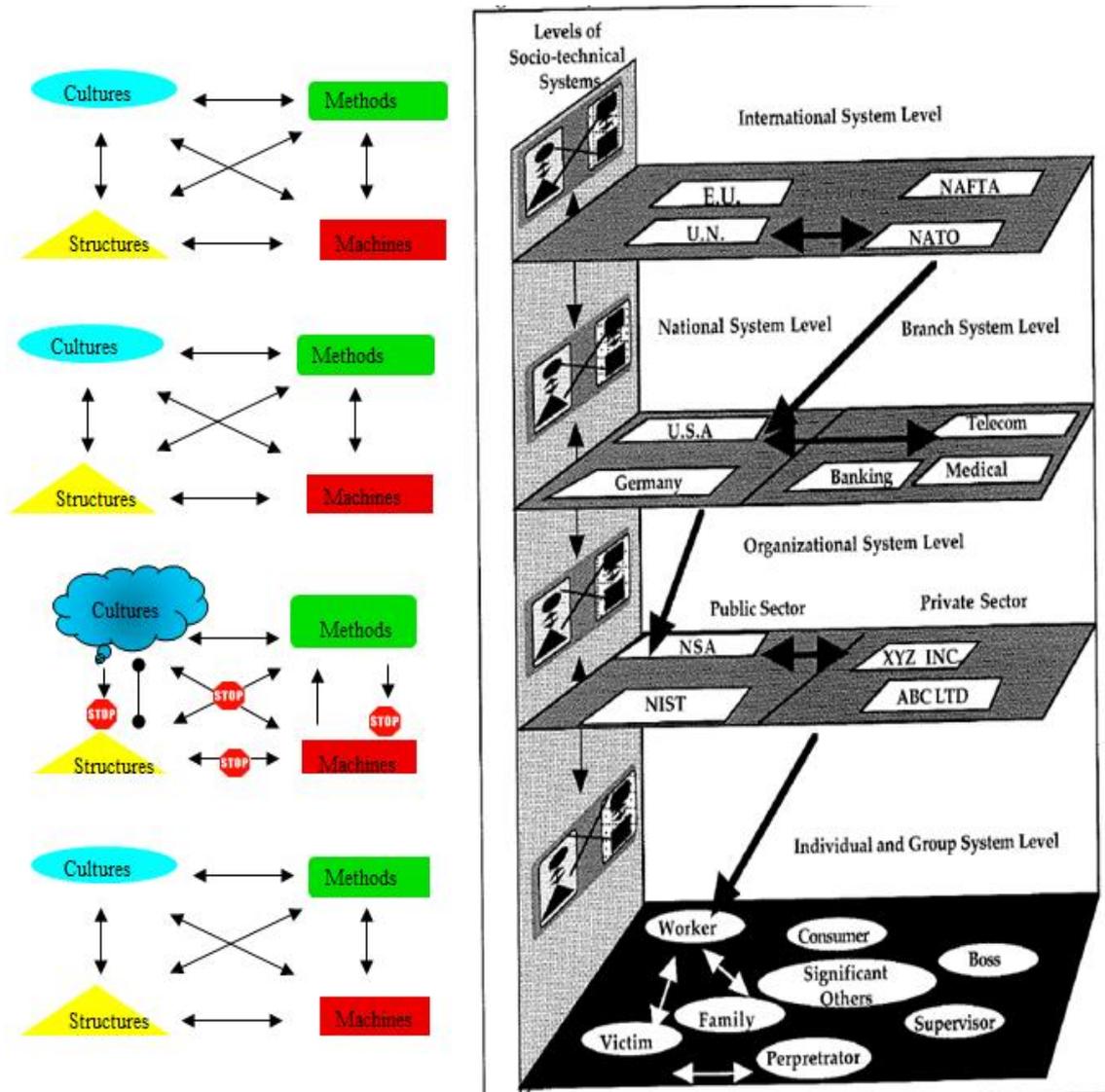


Figure 3: Levels of Socio-technical Systems Interaction

With this model in mind, drivers and hinders of organizational adoption and change, i. e. organization and system learning can be identified at different levels and with different causes. For example, adoption of the living document might not occur in an organization because the national authorities do not permit the sharing of “confidential lessons learned reports” outside of a country. Consequently the employees of this organization, even though they believe it would be helpful to another member of the CoP outside their country, they cannot share the lessons learned reports. This problem was echoed in the workshop and participants indicated that, in many cases, what is more important is not to know what is in the document, but to know the person who has written the document. It appears that web based systems are used more to figure out and find who are experts, than to find specific information to a given problem.

In order to manage something efficiently it is necessary to develop some measurements. In order to measure correctly it is necessary to develop a model. In this

report we present a model of learning process with 4 basic measurement points. Figure 4 outlines these points.

The first measurement point proposed is *how and when individuals in the community share information using the living document*, point (1). The second measurement point in the model is *how and when individuals in the community use the living document on an individual level*, point (2). The third measurement point (3) is *how and when they use this information at the organizational level*. The next measurement point is to see *whether the lessons learned moves up through the levels, from the organizational level up to the international level* (4).

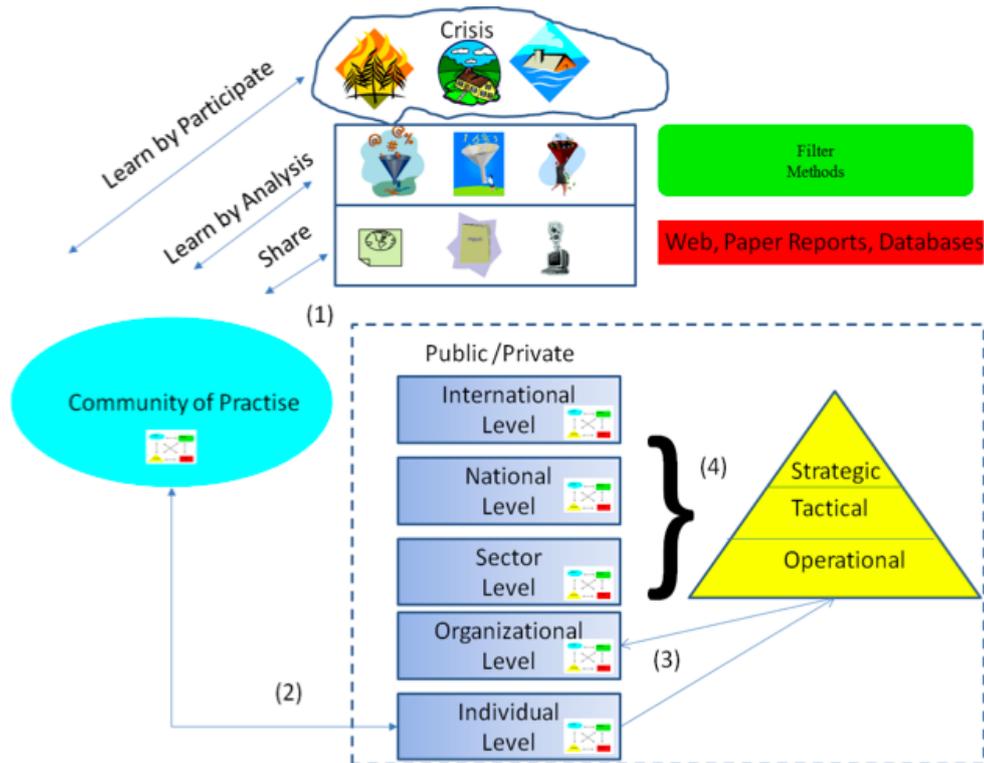


Figure 4: Measurement Points for Learning

4. RESULTS FROM EXPERTS INTERVIEWS

Four experts who had attended the 4th workshop were interviewed by phone. They were sent a copy of the model two weeks ahead of the phone interview and asked to review the document and be prepared to discuss their experiences with the learning process in the crisis management community and also their experiences with the ELITE workshop(s) and the living document. The interview lasted between 45 minutes to 1 hour.

The interview was structured following the document structure of deliverable 5.1 of the ELITE Project [18]. The experts commented on the different sections of the model. There was also a section in the interview for a general discussion about their experiences with the learning process in post crisis management and their reflections on the learning process in the workshop.

The experts were asked to first comment on the conceptual framework or model of the crisis management community as shown in figure 5 below.

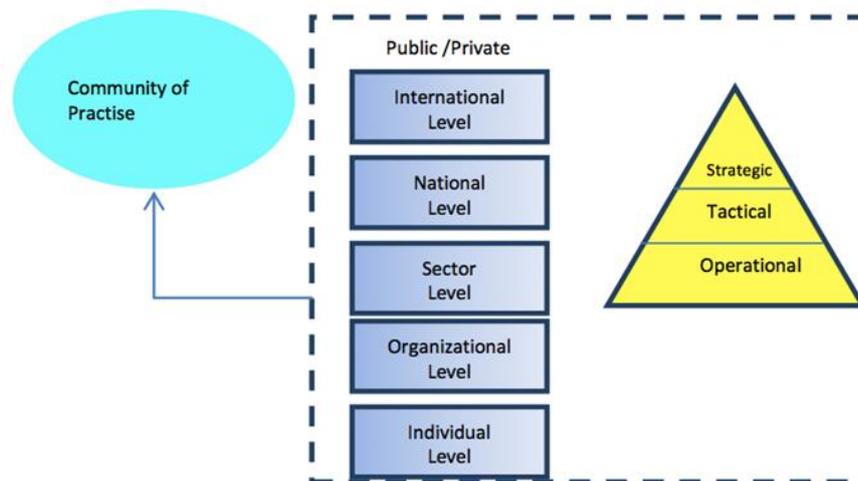


Figure 5: High Level Conceptual Model

One expert suggested that a layer between the individual level and the organizational level should be added. This was because much of the learning process occurs more in groups or teams than in organizations.

All of the experts were concerned about the appearance of the terms strategic, tactical and operational saying that these terms are used differently among different communities in the crisis management area. Consequently, classifying or naming the learning processes with these terms might cause more confusion in the community than needed. It was suggested that maybe by using the terms, lessons learned for long term decision making, medium term decision making and short term decision making might cause less confusion and create more consensus on the terms used in the community. It was pointed out by one of the experts that agreeing on a common terminology in the

crisis management community takes a long time but is very important. He gave an example, to reach agreeing on the terminology used in the INSARAG handbook [19] took in some cases 6 years of discussion.

The next model that was discussed with the experts was an extended model. The model included the ELITE projects' living document as the machine part of the model. Figure 6 below is the model that was shown to the four experts.

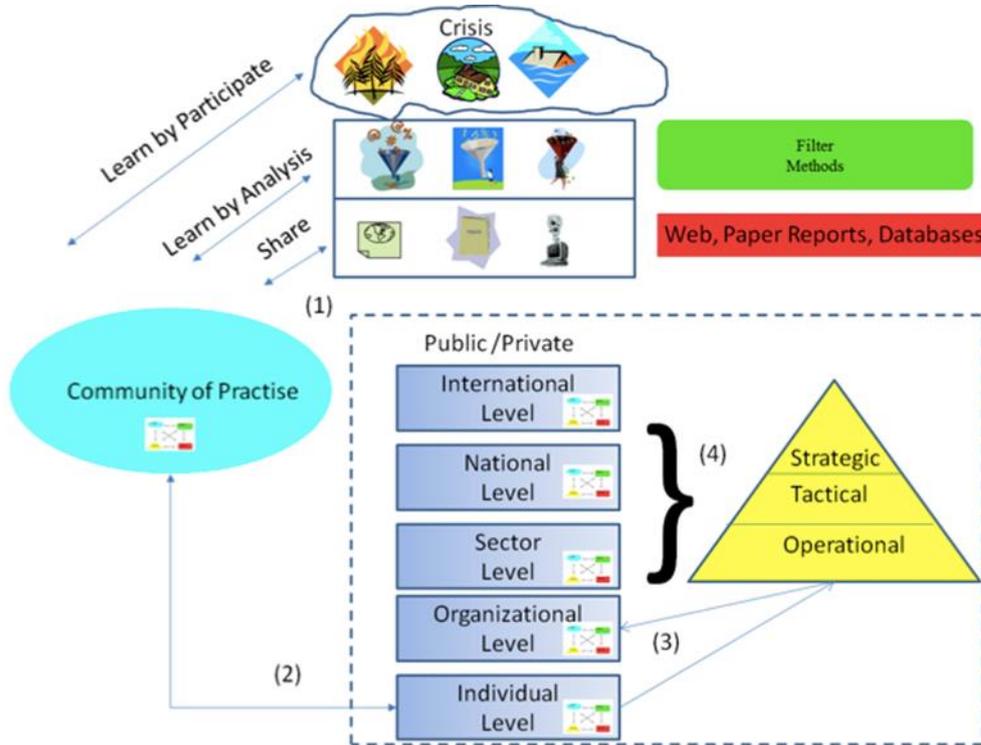


Figure 6: High Level Conceptual Model

For measurement point (1) the experts agreed that learning in the community did occur by participating in workshops and by working together to analyze the classification scheme used for the documents. They also agreed that, as individuals, they have learned. However most of the experts were skeptical as to how this community of practice could be used to bring about learning at measurement point 3 and 4. That is to say organization and national/international level. In order for this to occur an accredited agency has to approve both the categorization and filtering methods and the place of the document in the living document.

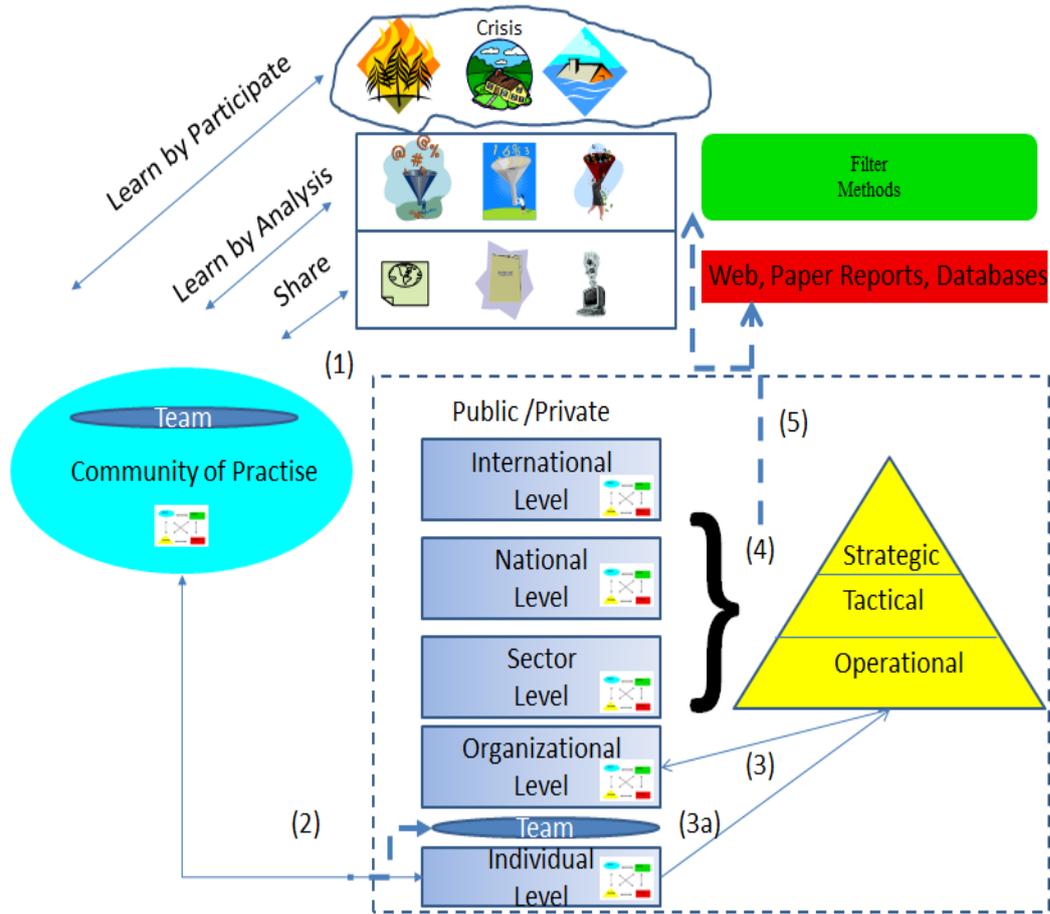


Figure 7: Model with new measurement points suggest by experts

Thus, as shown in figure 7 above, some new measurement points were introduced. At measurement point 5, an accreditation process needs to be put in place so that the classification scheme of the document and the document itself can be approved at the sector level, national level or international level before lessons learned documents can be placed in the “living document” database of the community of practice. Another new sub measurement point 3A in the model was introduced to include the concept of team learning as a level or sub-level between individual learning and organizational learning.

5. DESCRIPTION OF EVALUATION CRITERIA

Below we will outline tables that describe the evaluation criteria at different measurement points in the model. Some measurement can be quantitative in nature and some measurement will be qualitative in nature. The qualitative nature is required given the complex nature of measuring learning and change. For example it might happen that you have used a lesson learned from the living document to only partially change a practise or procedure after a crisis. Consequently the evaluations will need to use scale questions and analysis's for example using a Thurstone or Liket scales in the question response.

5.1 Learning Measurement Point 1

Here the individual or team is interacting with the ELITE living document and or participating in a workshop. At this measurement point the criteria can be both quantitative and quality in nature. A qualitative measurement criteria can be extracted from the evaluations and surveys done by the experts who attended the lesson learned exercise concerning a crisis. During the project a number of surveys at the workshop where performed asking the experts if they believed that they had taken back any relevant lessons learned from the workshop.

Table 2 Evaluation Criteria Measurement Point 1

1A	Survey and questionnaire results asking the community of practice members to rate their experiences at the crisis exercise or workshop.(Qualitative)
1B	The number of participants at the workshop who brought back or uploaded a lesson learned.(Quantitative)
1C	The number of Community of practice members who downloaded a lesson learned document. (Quantitative)
1D	The number of Community of practice members who read the lesson learned document.(Quantitative)
1E	The number of Community of practice members who ranked the lesson earned document.(Quantitative)
1F	The number of suggestions for new or revised categories or filters for lesson learned documents.(Quantitative)

5.2 Learning Measurement Point 2

At this measurement point, the members of the community of practice have acquired either through verbal or written communication an abstract or a concrete lesson learned as individuals or team members. In Workshop 1 and 2 it was observed and reported that individuals in crisis management share anecdotal information in three basic categories; new and better equipment, procedures and people.

Table 3 Evaluation Criteria Measurement Point 2

2A	The number of abstract and concrete lessons learned about new and good and bad equipment. (Quantitative)
2B	The number of abstract and concrete lessons learned about new procedures and good and bad equipment. (Quantitative)
2C	The number of new contacts made with new experts in a particular field. (Quantitative)
2D	The number of lessons learned about new documents.(Quantitative)
2E	The number of lesson learned about new laws or policies.(Quantitative)
2F	The number of courses or exercises recommended in the living document.(Quantitative)

5.3 Learning Measurement Point 3 and 3 A

At this measurement point the individuals or teams are operating within and through the formal stack of control i.e the organizational sector national, international levels). That is to say the individuals in the community of practice can come from different levels in the stack.

Table 3 Evaluation Criteria Measurement Point 3A and 3B

3A	The number of individuals at all levels that uses a lesson learned, process or equipment to change their day-to-day operations.(Quantitative)
3B	The number of individuals at a levels that uses a lesson learned, process or equipment to change their tactical approach.(Quantitative/Qualitative)
3C	The number of individuals at all levels that uses a lesson learned, process or equipment to change their strategy. (Quantitative/Qualitative)
3D	The number of teams at all levels using a lesson learned, process or equipment to change their day-to-day operations.
3E	The number of teams at all levels that using a lesson learned, process or equipment to change their tactical approach. (Quantitative/Qualitative)
3F	The number of teams at all levels using a lesson learned, process or equipment to change their strategy. (Quantitative/Qualitative)

5.4 Learning Measurement Point 4

At this measurement point regulations, laws and policies are used to transfer the lessons identified into lessons learned at the meta-system levels. Some very interesting work has been done using a socio-technical modeling approach to model the 1986 outbreak of the Bovine Spongiform Encephalopathy BSE epidemic in the United Kingdom by Cassano-Piché and Vicente Jamieson [20]. However, as recommended in deliverable 5.3 given the current complex nature of crisis management and the mature of post crisis management, we believe that no quantitative or qualitative measurement can be made. However the measurement point is included in the framework for completeness and possible future research.

5.5 Learning Measurement Point 5

The difficulty with creating measurements for point 4 does not however impede the possibilities to have concrete suggestions for measurement point 5. Here a measurement can be the number of lessons learned documents that are officially approved to be placed into the living document.

5A	The number of lessons learned documents accredited and placed in the living document from the sector level. (Quantitative/Qualitative)
5B	The number of lessons learned documents accredited and placed in the living document from the national level. (Quantitative/Qualitative)
5C	The number of lessons learned documents accredited and placed in the living document from the international level. (Quantitative/Qualitative)

6. CONCLUSION

This report has compiled outcomes from deliverables 5.1, 5.2, 5.3 to produce a framework for a learning process for post crisis management. It can be used in the future to monitor and manage the development of the community of practice that has been developed within the ELITE project.

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