

Facilitators and Barriers in Local Emergency Knowledge Management: Communities of Practice in Inter-Organizational Partnerships

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Abstract: A marked increase in crises, uncertainties and perceived risks has impelled the government of Norway to reconsider its contingency plans and devolve its emergency management capacity to local authorities. It has become imperative that any effective emergency management require collaborative effort at the local level, with municipalities sharing strategic resources, including knowledge repositories. The municipalities' lack of necessary resources to provide emergency management services, as required of them by law, compel them to seek ways of cooperation and coordination with other municipalities in their proximity. Municipalities have come to a realization that efficiency in anticipating and handling crises is dependent on the way they collaborate with each other. To remain prepared municipalities must share the knowledge needed to plan, anticipate and handle emergencies. Participating municipalities are obliged to establish knowledge-sharing strategies in order to promote interactions between crisis management practitioners. This paper examines the emergence of communities of practice in a crisis management inter-organizational partnership in a county in Norway. The paper identifies factors that advance or inhibit knowledge sharing process in this partnership.

Keywords: communities of practice, knowledge sharing, communication, public sector

1. Introduction

The ever-increasing number of crises has in recent years impelled governments around the world to actively and continually review their crisis management plans, seeking better ways of understanding risks, threats and vulnerability. Governments are expected to prevent unwanted incidences from occurring and to efficiently handle crises if they occur. Different crises happening around the world presents the authorities with new knowledge and learning opportunities for best (and worst) practices. The challenges posed by the new global order lead to a realization that new methods of proactively assessing, prioritizing and managing risks and crises are imperative. Creation of new knowledge repositories, modification of existing knowledge practices and development of efficient and effective strategies for gathering, storing and sharing knowledge are crucial elements for successful crisis management. Public organizations in general and municipalities are at the forefront of any efforts to handle any unwanted situations as every crisis, be it floods, terrorists attacks, gas explosions, or accidents inevitable takes place within municipal boundaries. Therefore as first point of encounter, it is crucial that municipalities are equipped with necessary knowledge to prevent, handle and minimize damage. For this reason, the government of Norway devolved its contingency plans to regional and local authorities in a new law which came into effect in 2011(Direktoratet for samfunnssikkerhet og beredskap, 2011). The aim of this paper to examine how, as a response to these changes, Hedmark County, an administrative region in the south-eastern part of Norway, is working together with municipalities and crisis response agencies in order to create platforms for knowledge and resources sharing. This paper discusses the emergency of these communities of practice as knowledge sharing platforms and also identifies factors that can facilitate or inhibit the knowledge sharing process.

2. Principles of emergency management in Norway

The Norwegian emergency management system is based on an umbrella model of geographic area responsibility with municipals, county administrative boards and the national government respectively assuming responsibilities at the local, regional and national level. Responsibility for emergency management lies in all levels of administration, with state maintaining the overall responsibility and the county administration is the state's representative at the regional level. The overall fundamental guiding principles for the Norwegian crisis management are principles of responsibility, parity and proximity(Ministry of Justice and Public Security, 2005). The principle of responsibility implies that an agency/actor in charge of an area in a normal situation also has responsibility for dealing with extraordinary events in that area. The principle of parity means that the organization should maintain

its daily structures and possibly remain the same during the crisis. The principle of proximity means that crises should be handled at the lowest possible level, where the crisis actually occurs. In order for the society to have a robust emergency response system, there must be requirements for emergency preparedness at all levels of government (St.meld.nr 17 (2001-2002)). It is necessary that authorities at different levels are capable of handling extraordinary situations occurring within their areas of responsibility. In most cases crises would involve different sectors thereby necessitating a need for co-ordination of efforts across different sectors and levels.

An increasing number of crises, internationally and locally, increased uncertainties and perceived risks have prompted the government of Norway to further decentralize its emergency management capacity to local authorities. The revised law on municipal emergency preparedness, civil protection and civil defence is indicative of the government's efforts to increase the municipalities' preparedness in handling uncertainty, to protect lives, health, and environment and material goods in peace times (LOV 2010-06-25 nr 45, 2011). It is a response which redefines roles and duties of different organs, including municipalities, establishes new warning systems, and defines work principles. Municipalities have two main duties ascribed to them; (a) risk and vulnerability assessment and (b) to develop contingency plan for the municipality (ibid.). The risk and vulnerability duty entails a systematic and continual evaluation /analysis of possible unwanted incidences that may occur in the community, an assessment of the likelihood of certain occurrences and their possible impact on society. On the basis of risk and vulnerability assessment municipalities should develop contingency plans that would boost their preparedness to handle unwanted incidences. The Directorate for Civil Protection and Emergency Planning has further outlined regulations, whose main goal is to ensure that municipalities fulfilled their responsibilities and duties in public safety and security (Direktoratet for samfunnssikkerhet og beredskap, 2011). Municipalities are expected to comprehensively and systematically assess situations, develop strategic plans, assign responsibilities, define decisionmaking

structures, and coordinate risk and emergency work. It has become essential that any effective emergency management would require collaborative efforts between the public and private sector constituencies within municipality boundaries, with municipalities sharing strategic resources, including knowledge repositories, with other neighbouring municipals. Municipals in Norway have different demographics, with some municipals having less than 5000 inhabitants, thereby little resources. This factor compromises their ability to fulfil the new mandate. The municipalities' lack of required resources to provide emergency management services, as required of them by law, compel them to seek ways of cooperation and coordination with other municipalities in their proximity. The main objective is to share competences, and knowledge needed in order to plan, anticipate and handle emergencies. Municipalities have come to a realization that efficiency in anticipating and handling crises is dependent on the way they collaborate with each other, by entering into partnerships, creating networks in crisis management. Several questions emerge within this constellation. How can sharing of knowledge be facilitated within and between municipals? What methods would be best suitable for knowledge sharing? How can emergent communities of practice (COPs) promote an environment in which knowledge can be created and shared? What communication channels are likely to facilitate efficient communication? What structural, cultural or other barriers are municipalities like to face in their efforts to sustain their emergency work?

Knowledge sharing will thus become one of the most important strategic assets that will improve the municipals' emergency work. Identifying facilitators and barriers can shade light to the questions posed above.

3. KM interventions in emergency management

It is widely recognized that knowledge management (KM) is an important strategic resource in organizations, and its management is considered critical to the organizational success (Ipe, 2003; Davenport and Prusak, 1988; Wang and Noe, 2010). This recognition of KM as key resource for organizations underlines a need for organizations to put in place systems for managing different aspects of knowledge, be it tacit or explicit knowledge. It affirms a need for processes and technologies that facilitate the capture of knowledge, sharing and its effective utilization. As Ipe (2003) has argued in order for organizations to capitalize on the knowledge they possess, they have to understand how knowledge is created, shared, and used within organizations. In knowledge management literature, knowledge creation, sharing and dissemination are the main activities in knowledge management (Eid and Nuhu, 2011; Nonaka and Takeuch, 1998). Knowledge sharing is critical to knowledge creation. As a central part of the KM practices knowledge sharing is the exchange of experience, events, thoughts or understanding of anything (Kim and J, 2004). However

KM researchers have also noted the existence of different dimension of knowledge which in various degrees impede on knowledge sharing exercises. For simplicity purposes knowledge has been classified as either explicit or tacit (Nonaka and Takeuchi, 1995). Of these two distinctions, it is much easier to share explicit knowledge since it is readily available and codified in documents and databases. It is however difficult to share tacit knowledge due to the fact that it is personal knowledge embedded in individual cognitive processes. Sharing tacit knowledge is therefore dependent on the willingness of the individuals to share their knowledge, with whomever they choose to do so. Thus 'knowledge sharing can be seen as a social interaction culture, involving the exchange of employees' knowledge, experiences and skills through the whole department or organization' (Eid and Nuhu, 2011: 50). Some researchers have argued that even under the best circumstances, knowledge sharing is a multifaceted, complex process (Hendriks, 1999) and knowledge in organizational settings tend to be fuzzy in nature and closely attached to the individuals who hold it (Davenport and Prusak, 1998).

According to Nonaka & Takeuchi, (1995) organizations cannot create knowledge without individuals, and unless individual knowledge is shared with other individuals and groups, the knowledge is likely to have limited impact on organizational effectiveness. Therefore an organization's ability to effectively leverage its knowledge is highly dependent on its people, who actually create, share, and use the knowledge (Ipe, 2003). Knowledge sharing can therefore in certain circumstances be regarded as a voluntary activity dependent on the individuals' willingness to share and to receive. It is also dependent on the availability of channels for knowledge communication or distribution. A number of factors influence knowledge sharing and these include the nature of knowledge (tacit or explicit), motivation or incentives to share, chances to share, and the culture of the work environment. These factors are interconnected. Knowledge sharing is increasingly regarded as a central ingredient for any knowledge management processes. There is an acknowledgement among researchers that knowledge sharing is critical to the long term sustainability and success of any organization. Communication is central to knowledge sharing processes. However moving knowledge from one part of the organization to another is a well-known challenge in knowledge management (Schwartz, 2007). Efforts to effectively and efficiently move knowledge within organizational units are today highly dependent on computer mediated communication, which today have grown to include an endless list of applications - e-mails, instant messaging, video and voice conferencing, social networking and wikis.

4. Communities of practice in emergency management

Communities of Practice (CoPs) are increasingly regarded as an important element within management literature (Iverson and McPhee, 2008; Buysse et al., 2003; Probst and Borzillo, 2008). There is however no standard definition of what constitutes communities of practice, their characteristics and how they emerge. As noted by Pemberton *et al* (2007) CoPs can have different meanings, interpretations and implications dependent on context (Pemberton et al., 2007). Wenger *et al* (2002) defines a community of practice as "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in the area by interacting on an ongoing basis" (Wenger, et al, 2002:4). Practice entails a set of frameworks, ideas, tools, information, styles, language, stories and documents shared by the community" (Wenger et al., 2002). CoP is model of situational learning, based on collaboration among peers, where individuals work to a common purpose (ibid). Probst and Borzillo (2008) highlight how CoPs differ from other types of intra-organizational network such as project teams, operational teams and other informal networks. The gap between communities of practice and other types of networks is however very elusive. This work centres mainly on the functional aspects of CoPs. CoPs aim at developing an environment in which knowledge can be created and shared in order to improve effectiveness in the CoPs field of interest. They facilitate exchange of know-how and create contexts for easier reuse of knowledge. Communities of practice as presented by Wenger provide a potentially useful framework for examining work based collaborative learning and management of new knowledge. As a tool for knowledge management CoPs can potentially provide a platform for collaboration, creation, management and dissemination of new knowledge. Amin & Roberts (2008), on the basis of an extensive literature review of academic and management literature, observe that there exists different kinds of situated practice with quite varied processes and outcomes, gathered around distinct forms of social interaction (Amin and Roberts, 2008). They come up with useful typology of collaborative working, namely, *task/craft-based work*, *professional practice*, *epistemic or highly creative* collaboration, and *virtual* collaboration (ibid: 354). These typologies offer distinctive spaces of situated

learning and they differ in terms of the character of knowledge production, the knowledge used and produced, and the nature of social interaction. Amin and Robert's typology provides a useful framework for examining communities of practice in emergency related work in Hedmark County. Juriado and Gustafsson's (2007) study on communities of practice raise a number of issues that may occur in inter-organizational partnerships involving public and private partners, like the one explored in this paper.

5. Methodology

This paper employs qualitative research methods in the form of focus group discussions and archive research. The focus group discussion was used as the primary means of collecting qualitative data. The discussion involved officials in the department of emergency planning and administration at the Hedmark County Governor's office. The county has the overall coordinating responsibility and the official in the focus group have different responsibilities. A discussion guide was sent to the official beforehand and was then used as a guide to the discussions held at the county offices. The officials gave an account of their work and methods of knowledge sharing such as seminars, workshop and desk training sessions. They also gave their perceptions on crisis management issues in the county. The paper also draws its empirical material from relevant documents, such as government laws, white papers, and risk inspection reports from the county.

6. KM-centred communities of practice in Hedmark County

Hedmark County's work on risk and crisis management reveals an intricate web of networks, interorganizational-partnerships and external communities of practice that span organizational boundaries, incorporating actors in both the public and private sector. These formations also transcend county and municipal boundaries, and operate within an environment characterised by uncertainty, complexity and therefore knowledge sourcing and sharing presents a particular challenge. This complexity presents both opportunities and challenges for sourcing and sharing of knowledge in external environment. Communities of practice (CoP) have emerged in Hedmark County, mostly as intentionally created communities as the county authorities, municipalities and other stakeholders seek methods of capturing, storing and disseminating the knowledge required before, during after emergency response. These are communities created for the sole purpose of bringing together professionals whose daily work involve various aspects of risk and crisis management. This constellation of professions fits into Buysse, Sparkman and Wesley's (2003) observation that communities of practice are "a group of professionals and other stakeholders in pursuit of a shared learning enterprise, commonly focused on a particular topic" (Buysse et al., 2003: 4). These communities of practice in Hedmark County are both internal and external depending on the area of knowledge. CoP members share an interest in development best practices in their knowledge field. Intersectoral collaboration is a critical element in these inter-organizational networks, where municipals compelled to establish communities of practice and knowledge-sharing strategies in order to promote interactions between crisis management practitioners. These collaborations occur within the municipals divisions, between units in different municipals and other emergency actors like the police, local emergency service, civil protection unit and hospitals. Entities must share their knowledge if they are to contribute to learning within the network and thereby improve their capabilities in handling crisis situations.

From interviews with officials at the county's emergency and administration section *task/ craft-based activities* are regarded as key forms of collaboration. According to Amin & Roberts (2008), the practices of knowing central to many craft and task-based communities require repeated practice of certain tasks under core supervision from core members of the community. In the interviews, the county officials recounted that they carry out a number of training game exercise with specific communities in the municipals, which in a way creates special interest group within the chosen task area. These game exercises are task specific, focusing on a strategically chosen area. For example, as from 2008 the county developed a four year plan to carry out game exercises in all its 22 municipalities within the area of water supply. The exercise was designed as a game event based on an incident in the water supply and presents the municipalities with a number of challenges. The actors in the game are drawn from the county offices. Observers to the game exercise are drawn from the strategic partners who have either responsibility in the water management area or whose

activities/responsibilities are likely to be affected by water problems. The primary partners in this case are the Norwegian Water BA and Driftassistansen i Hedmark (DiH). Norwegian Water is a national association of water and wastewater work operated by the municipalities and some inter-municipal companies. These include affiliated organisations like water suppliers, wastewater industry as well as research institutions. DiH is an inter-municipal company that provides technical and operational services to water management systems. Secondary actors include Food Safety Authority, Police and Armed Forces and Civil Defence. Through these game exercises, the social interaction cultivated over the four year period fits well into Amin and Robert's typology of task-based CoP, where social relations are characterised by "close proximity and face-to-face interaction" (Amin & Roberts, 2008). Closely linked to the game based exercise, the county has also coordinated *full-scale exercises* where focus is learning through task-related exercises. These exercises provide inter-organizational learning and knowledge-sharing, by bringing together specialised emergency organizations like the police, pre-hospital emergency services, and fire and rescue services. The full-scale exercises in the municipalities of Trysil (2009) and Elverum (2010) are an example of task-related communities. The primary purpose of these exercises is to increase the municipals' emergency preparedness, crisis leadership and collaboration between emergency organizations. Knowledge sharing in this context is explained as putting knowledge into practice and reproducing certain kind of craft-knowledge through shared practice. The preferred mode of knowledge sharing in these exercises is through verbal and physical communication. This inter-organizational learning process is coordinated by the county but is manned by a committee for training exercises, led by the police. This committee has most of the characteristics of a community of practice.

Another task-based CoP in the county is an arena for emergency contacts in all the county's municipalities. *Municipal Emergency Contacts* are those who work as contacts for emergency in their municipalities. Regulator meetings and seminars are held with these contacts in order to create a meeting place where they can exchange feedback and ideas with other contacts in similar positions. *County Emergency Committee* composed of key public emergency actors, voluntary organisations, and private sector, which on their own has expertise on emergency work in their areas, is another forum for mutual briefing and exchange of information on emergency work. In a crisis situation the committee will act as a central cooperation and support organ for the county leader. Most of the agencies represented in this committee have learned from previous experiences. Another form of collaboration is manifestly in *professional groups* like police, civil defence, fire and rescue services ambulance and pre-hospital units. Professional groups acquire their knowledge through lengthy periods of training (intellectual capabilities) and have within them different communities of practice.

7. Discussion: Barriers and facilitators to knowledge sharing

The Emergency and Administrative Affairs department at Hedmark County is manned by four members of staff and these have to contribute to the Civil Protection and Emergency Planning in the county. In spite of these limitations, the county has systematically worked to set up and promote up communities of practice around key focus areas, providing guidance and coordination role in order to sustain these structures. Given the limited human resources, communities of practices are a primary option to implement KM in the county. Stein (2007) observes that at the least communities of practice can be viewed as a means of implementing KM in organizations and in cases where organizations are reluctant to commit financial resources setting up CoPs are perceived as a low cost alternative. After identifying the CoPs in Hedmark County, this paper also sought to determine the factors inhibiting or facilitating the knowledge sharing process within and between these communities of practice. Four main activities were identified and presented to the interviewees. These are (1) the existence of knowledge sharing platforms, (2), cooperation (3) communication, and (4) epistemic related factors (see Figure 1).

As noted above the county has been proactive in setting up meeting places for CoPs. Several platforms have been set up at municipal, inter-municipal and county levels. These CoPs have different formal structures, are of different sizes and operate at different levels. During interviews, it was pointed out that the main challenge to the sustainability of CoPs is the replacement of staff. The CoPs whose members are made up of elected officials often get major changes after municipal elections. It is however the replacement of municipal chief executive which impacts negatively on the growth and survival of the CoPs. The chief executive is the leader of municipal crisis management and sits in different CoPs within the municipal and at the inter-municipal level. Hence the knowledge assets of the chief executives are important for the sustainability of CoPs. There have been some notably personnel changes in this position and this affect continuity and dynamics of the groups.

Other factors listed in (1) were not cited as barriers.

On the issue of cooperation, the county and municipal have an explicit or implicit contract that serves as a cornerstone of the relationships between the networks or communities of practice. This contract emanates from the duties, responsibilities and expectations as espoused in the law of municipal emergency duties. As such participation in meetings and seminars has been satisfactory. (Stein, 2007) identifies meetings, commitments to future meetings and established means of communication as essential features in ensuring the success of communities of practice.

Activity	Possible barriers	
(1) Arena for knowledge sharing	Composition of groups Group structure and size Lack for time (for group activities) Too many groups Lack of teamwork Lack of engagement Replacement of staff	
(2) Cooperation	Lack of engagement from other institutions Diversity of assignment Priority areas Individualised knowledge Attitudes to knowledge sharing	
(3) Communication	Information overload Lack of communication lines Lack of communication between knowledge fields Lack of access to information database Lack of time Ineffective tools for information dissemination Lack of discussion spaces	
(4) Epistemic factors	individualised knowledge lack of know-how lack of know-who	

Figure 1: Key factors discussed with county officials.

Communication is an essential feature of CoPs and “identifying the communicative process central to enacting CoP relations is crucial” (Iverson and McPhee, 2008:177). KM is negotiated communicatively between people (Iverson and McPhee, 2002). The nature of internal and external communicative processes is essential for communication of knowledge. Information overload and information databases were not cited as barriers to knowledge sharing because the county officials rely mostly on face-to-face interactions. In spite of a huge geographical area covered by the county, the emergency planning officials emphasized the importance of inter-personal communications over *virtual collaborations*. Besides static reports on its website, the county does not have any technologymediated

social interaction forms. The absence of technological mediation means that key knowledge repositories are not stored in information databases. It can be argued that the communicative processes used by the county are not sustainable in the future as they are firmly anchored on individuals, mainly as tacit knowledge. Interpersonal communications by nature has its limitations such as distortions and noise in the communication process and other individual characteristics which impinge on the reception of messages.

Human factors can either enhance or impinge on knowledge sharing depending on the nature of relations within and between CoPs. Knowing the right people and bringing them together into networks of individuals sharing similar interest in an aspect of emergency management is essential. Communities of practice have thus developed as active know-how platforms within and between municipals and county. However as O’Dell and Grayson (1998) observe “the lack of contact, relationships and common outlook between individuals is a manifest barrier to the transfer of the knowledge” (cited in Kimble and Bourdon, 2008: 463). It is also evident from the interviews that while relationships are relatively strong in certain CoPs within the county, some municipals are less committed than others, especially smaller municipalities. Motivation also varies between individuals and this affects their participation levels. The County officials therefore emphasize that human resources are a key factor for knowledge sharing within local emergency management structures.

8. Conclusion

From a theoretical viewpoint, inter-municipal cooperation is imperative for successful local emergency management. The aim of this paper was to gain insight into different forms and levels of collaboration, and how knowledge sharing mechanisms such as CoPs have emerged. Establishing networks and setting up CoPs in the municipal sector is fraught with many challenges, most of which are not explored in this paper. Organizational structures, financial models and the different forms of intermunicipal cooperation inevitable affect the establishment and work of CoPs. Establishing CoPs is a process which takes a long time and understanding and defining how they should work is a mammoth task. This paper confirmed the importance attached to CoPs based approaches to KM in Hedmark County and showed that human factors were essential factors that need to be addressed. Awareness of barriers is essential if these could be transformed into being facilitators for knowledge sharing. The paper has identified various factors that influence knowledge sharing in communities of practice. The manner in which these CoPs are formed, their organization structures, and their forms of interaction and are crucial for their success and sustainability. More research is needed into the internal dynamics of CoPs, especially their communicative aspects. A case study of CoPs, both within and between municipalities can provide answers as to what can be regarded as success factors for communal emergency knowledge management.

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