Exploring Capabilities that Constitute Inter-Organizational Crisis Management

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ABSTRACT

Crises are infrequent, unpredictable and complex events. Managing such events requires well-prepared and well-coordinated efforts by several response organizations. Hence, a sufficient inter-organizational crisis management (ICM) capability is critical for sustainable societies. To ensure the ICM capability, approaches for enhancing and evaluating it are needed. The objective of this study was to identify and elaborate a clearly defined set of capabilities that constitutes ICM capability. The study was performed by an explorative literature study, where identified capabilities related to ICM were clustered. The cluster of capabilities was iteratively evaluated and refined. The study resulted in 14 capabilities that constitute ICM capability, which were divided into core, supportive, and enabling capabilities. The set of capabilities may provide a foundation for a framework of ICM capability with the ability to support assessment of ICM performance both in exercises and in real ICM operations, as well as in the design of ICM exercises.

Keywords

Capability, Inter-organizational crisis management, Exercises, Assessment.

INTRODUCTION

The increasing occurrence of terrorism, natural disasters and large-scale accidents put pressure on societies to provide a sufficient crisis management (CM) capability (World Economic Forum, 2019). These events are characterized by infrequency and unpredictability, and the complexity and scale are too large for individual organizations to handle by themselves. Therefore, inter-organizational crisis management (ICM) is needed, where CM organizations collaborate in structures not always given in advance and with the need to improvise within the framework of laws and regulations (Ley, Pipek, Reuter and Wiedenhoefer, 2012; Mendonca, Jefferson and Harrald, 2007).

Although the number of large crises is increasing the frequency is still relatively low, which means that most CM organizations rarely need to handle these kinds of events. This implies that these organizations do not gain sufficient experience of conducting ICM operations in their daily work. As they are required to be able to handle these events, ICM exercises are needed to achieve, maintain and ensure ICM capability (Boin and McConnell, 2007). They are also an efficient method for developing, maintaining, and ensuring ICM capability (Borell and Eriksson, 2013).

A clearly defined set of ICM capabilities may serve as guidance in the design of ICM systems, i.e., overarching requirements of what an ICM system must be able to accomplish. Furthermore, the set of capabilities could be used to determine what features of the ICM system that could be enhanced by introduction of an information system support. In addition, capabilities provide a clear focus for the evaluation of ICM exercises (Greenberg, Voevodsky and Gralla, 2017). However, to ensure that ICM exercises actually result in increased (or maintained) ICM capability, this capability needs to be monitored and assessed.

Eriksson and Hallberg (2019) described several dimensions of CM exercises to ensure that the results are useful for their expected purpose. For example, they emphasized the importance of considering the objective of the CM exercise when selecting the format. Since these exercises are complex and resource-intensive, it is important to gain as much as possible from them. Furthermore, the exercises could be driven by a scenario or by capabilities. In a capability-driven ICM exercise, it is important to choose relevant capabilities, which can also be monitored and assessed.

The objective of this study was to identify and elaborate a clearly defined set of capabilities that constitutes ICM capability. Hence, it is focused on the inter-organizational part of the CM and does not cover the actual crisis response. The prospective objective was that these capabilities would provide a framework for assessment of ICM capability, both of performance in ICM exercises and for analyses of real ICM operations. This may also support the design of ICM exercises, e.g., by ensuring that scenarios are developed, where participating ICM organizations are challenged by significant aspects of ICM capability.

The nine aspects of capability identified in Granåsen, Olsén, Oskarsson and Hallberg (2019) represent broad thematic areas related to ICM capability that have been in focus for capability evaluation. In this study, these thematic areas formed the starting point for elaborating more clearly defined and detailed capabilities.

BACKGROUND

This section presents CM capability, assessment of ICM capability, and the CM system.

Crisis management capability

The term *capability* is frequently used in the crisis management literature, but it is rarely defined (Hallberg, Jungert and Pilemalm, 2014; Lindbom, Tehler, Eriksson and Aven, 2015). However, Lindbom et al. (2015) identified five trends based on a literature review of capability definitions: (1) capabilities are basically similar to resources, (2) resources are important components of capability, (3) capability is the ability to do something, (4) capability is about capacity, and (5) capability affects an outcome or a goal. Hallberg et al. (2014) defined capability related to systems engineering as *the ability to do something*. Lindbom et al. (2015) performed an analysis of how the term capability is used within the emergency management domain and found that it is usually used in relation to resources and capacity.

Greenberg et al. (2017) categorized capabilities in the context of disaster and oil spill responses as functional capabilities, managerial competencies, and capabilities that enable adaptability and flexibility. Functional capabilities are needed during a specific kind of response, and they are the type most frequently referred to in practitioners' guidelines. Managerial competencies are capabilities that are needed in all types of crises, for example, leadership, coordination and decision making. Capabilities that enable adaptability and flexibility are critical since there are always uncertainties in a crisis, which means that being prepared for anything is important. Capabilities that enable adaptability and flexibility include improvisation and the ability to transfer knowledge from past events to the present crisis (Greenberg et al., 2017). In the current paper, *crisis management capability* is defined as the capability to cope with major crises, emergencies and disasters. Furthermore, *inter-organizational crisis management (ICM) capability* is defined as the capability to carry out the inter-organizational part of CM.

Assessment of inter-organizational crisis management capability

To develop, maintain and ensure a capability, it is necessary to be able to assess it. However, it is not possible to directly assess ICM capability since it is a complex concept that comprises several, both dependent and independent, aspects. Hence, aspects of ICM capability that can be used for assessments have to be determined. Comfort (2007) suggested the four concepts cognition, communication, coordination, and control as essential components of inter-organizational performance. Granåsen et al. (2019) identified nine aspects of ICM capability: interaction, coordination/C2, decision making, relationships, situation awareness (SA), resilience, preparedness, system performance, and information infrastructure. One of the results from the literature review was that the terminology is inconsistently used and the concepts studied are rarely defined (Granåsen, et al, 2019). For instance, two studies claiming to assess *collaboration* may assess different phenomena. Hence, it is difficult to compare the results from different studies although they claim to study similar concepts. Thus, there is a need for a more coherent and specific terminology and the concept studied being clearly defined. Defining the different elements of ICM capability as measurable components is a prerequisite for valid and reliable assessments.

Identifying the most suitable methods for assessing ICM capability is challenging. At ICM exercises, empirical observation studies of the nine aspects of ICM capability as identified in a literature review by Granåsen et al. (2019) revealed that while some aspects may be investigated through observation, others need to be measured by

methods such as surveys or sophisticated analyses of information produced and transmitted in information and communication systems (Oskarsson, Granåsen and Olsén, 2019).

The crisis management system

In most countries, CM systems are organized in three levels of authority: local, regional and national (Wimelius and Engberg, 2015). Local authorities are responsible for crises that affect the local community. Regional authorities are responsible for crises that affect the region and regional coordination of activities and resources. National authorities are responsible for crises that affect the nation and national coordination of activities and resources.

The organization of CM can take the shape of a formalized hierarchical organization or a loosely coupled network. Network-based approaches to CM can lead to the emergence of spontaneous networks, based on mutual interests of individuals and organizations (Ödlund, 2010). Even though the study presented in this paper to a large extent is based on international literature, parts of it are related to the conditions of the Swedish CM. The Swedish CM system is organized in local, regional and national levels, and it is regulated by three principles: (1) *Responsibility*, which means that the organization that is responsible for an activity in a normal situation maintains its responsibility during a crisis, (2) *Parity*, which means that the organizations, as far as possible, should be organized in the same way during a crisis as in their daily work, and (3) *Proximity*, which means that a crisis should be managed by those CM organizations that are based in the affected area (Wimelius and Engberg, 2015; MSB, 2014).

In contrast to several other countries, the command structures in the Swedish CM system are characterized by a flat hierarchical structure and extensive autonomy for CM organizations (Wimelius and Engberg, 2015). All organizations are legally equal and, in case of a crisis, they are expected to collaborate across organizational boundaries and support each other with resources and expertise. The conditions for how this collaboration should be performed are not specified in laws and regulations (Karlsson, 2015). Thus, the leadership is task oriented and decentralized, with a large degree of freedom for subordinate organizations to decide on how to manage the situation.

The County Administrative Boards (CAB) represent the government in each of the 21 Swedish counties, and they are responsible for coordinating the CM activities in their region. However, a CAB does not have the authority to force other organizations to collaborate (Wimelius and Engberg, 2015). Still, if there is a crisis in a region, the CAB generally initiates a function for collaboration, where involved organizations share information and coordinate actions and resources.

METHOD

This study was carried out in five activities. The first activity was an explorative literature study to identify capabilities that constitute ICM capability. Eighteen publications with alternative sets of capabilities were identified from, e.g., governing handbooks regarding ICM, studies of crisis management exercises, and descriptions of military C2 capability. The outcome of the activity was the identification of 111 capabilities.

The second activity was to assess the relevance of the identified capabilities. This was performed in two steps. In the first step, three researchers individually assessed the relevance of the identified capabilities on a five-point Likert scale: (1) Not relevant, (2) Questionable relevance, (3) Unsure, (4) Moderate relevance, and (5) High relevance. In the second step, the outcome of the individual assessments was jointly analyzed by the three researchers. Capabilities assessed as relevant or irrelevant by all three researchers were either accepted or rejected. Capabilities where the assessments on the scale differed were jointly discussed regarding their relevance for ICM capability. In this work, the capabilities were categorized in three groups: (1) Not relevant, (2) Ambiguous relevance, and (3) Relevant (Table 1).

Table 1. Example of capabilities and how they were assessed

Identified capability	Category
Set and Monitor Progress towards Goals and Objectives	Relevant
Ability to use ICT system to communicate with other organizations	Ambiguous relevance
Policy for effective implementation	Not relevant

The outcome of this activity was an assessment of 60 capabilities that were relevant for ICM capability, 17 capabilities with ambiguous relevance, and 34 capabilities that were not relevant for ICM capability.

The third activity was a categorization of the 60 capabilities into groups with similar capabilities. For each category an overall capability was defined, which represented the included capabilities. For example, *coordination/C2*, *identify and address needs by leveraging resources* and *prioritize response efforts* were compiled with the capability *coordinate activity and resources*. The categorization was performed by two researchers. The outcome of this activity was a set of 11 tentative overall capabilities.

The fourth activity was to scrutinize and improve the set of tentative overall capabilities. This was carried out in two steps. In the first step, the set of overall capabilities was presented to five experts with solid experience of capability development and ICM. Their comments were used to improve the set of overall capabilities, for example, to distinguish between capabilities that directly affect CM and those that are more supportive in nature. In the second step, the improved set of overall capabilities was divided into four core and seven supportive capabilities. The capabilities were discussed in a workshop with representatives from the Swedish CM system. Their comments were used to finalize the descriptions of the capabilities, but no new capabilities were added. However, some clarifications were made and a further division transformed one of the supportive capabilities into a set of four enabling capabilities. The outcome of the activity was a clearly defined set of 14 capabilities, divided into core capabilities, supportive capabilities, and enabling capabilities.

RESULTS

The results comprise a description of the 14 identified capabilities divided into four core capabilities, six supportive capabilities, and four enabling capabilities. The *core capabilities* are defined as fundamental cornerstones of ICM capability. The *supportive capabilities* are defined as necessary to achieve the core capabilities. The *enabling capabilities* are defined as representations of what needs to be in place to ensure the realization of efficient ICM collaboration. Thus, both supportive and enabling capabilities can be viewed as more concrete instantiations of the core capabilities, which constitute more abstract representations of ICM capability.

Core capabilities

The four core capabilities have a direct impact on the crisis system's performance by affecting the involved organizations (Figure 1). Thereby, these capabilities constitute the fundamental cornerstones of the ICM capability. If one of the core capabilities is lacking, the ICM capability becomes inadequate. The four core capabilities are: (1) compile and distribute a common operational picture, (2) establish and share a common direction, (3) coordinate activities and resources, and (4) coordinate communication to the public and the affected actors.

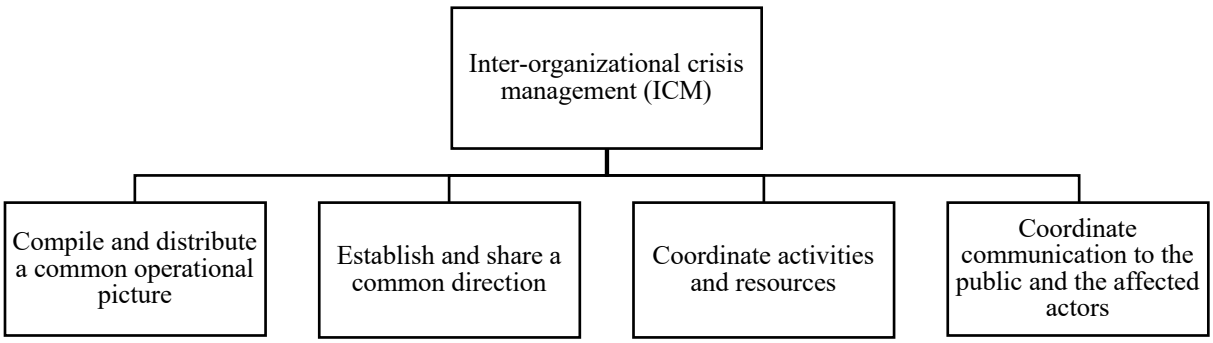

Figure 1. The four core capabilities of ICM

Compile and distribute a common operational picture

The capability *to compile and distribute a common operational picture* means being able to: (1) obtain information about the situation from involved organizations, (2) assess the obtained information and produce a common operational picture, (3) establish the operational picture, and (4) communicate the operational picture to the engaged and affected organizations. The operational picture is an important tool for information sharing among partaking organizations. According to Bharosa, Lee and Janssen (2010), access to core information enhances effectiveness. The information in the common operational picture is compiled and analyzed to be used for sharing

information between involved crisis management organizations. However, parts of it could also be useful for informing politicians, affected organizations, and the public. In order to maintain confidence in the system's ability to handle the situation, it is important to provide a unified and balanced picture of the situation.

Establish and share a common direction

The capability *to establish and share a common direction* means, based on the understanding of the situation, being able to: (1) generate and assess alternative courses of actions, (2) decide on a course of action, and (3) communicate the decided common direction. Common direction is the shared overarching concept of what should be accomplished and how to achieve it in order to manage the situation. Moreover, the interests of the involved CM organizations need to be taken into consideration (Hocevar, Jansen, and Thomas, 2011). For organizations that need to solve complex challenges together, a common direction is essential to reach a desired position. The common direction makes it possible for collaborative organizations to coordinate their activities.

Coordinate activities and resources

The capability *to coordinate activities and resources* means, based on the understanding of the actual situation and established direction, being able to: (1) make decisions regarding actions and utilization of available resources, and (2) communicate the decision to involved organizations. According to Greenberg et al. (2017), coordination is needed in all kinds of crisis management. To ensure the most effective use of available resources in order to meet the overall objectives, the needs for these have to be coordinated. Furthermore, coordination means aligning organizations‘ actions to achieve a shared goal (Comfort, 2007).

Coordinate communication to the public and the affected

The capability to *coordinate communication to the public and the affected* means, based on the understanding of the situation, being able to: (1) establish needs for a common purpose of communication, message and target group, (2) formulate an announcement that conveys the message, (3) determine which communication channels should be used, and (4) communicate the message. The ability to provide unanimous and consistent statements about the situation is vital. Contradictive information may lead to decision makers and the public losing confidence in the involved organizations' ability to deal with the situation. Lack of information can give rise to paracrisis, which is a primarily reputational threat (Coombs, 2014). Absence of information may further result in rumours about both the involved CM organizations and the crisis. Coombs (2014) argued that the absence of information indicates passivity and provides other actors with the opportunity to take control and fill the information vacuum with their views. This can lead to decreased credibility for the ICM system.

Supportive capabilities

The supportive capabilities are significant to maintain the core capabilities. They can be seen as building blocks that enable the core capabilities. Hence, each core capability is dependent on several supportive capabilities. The six supportive capabilities are: (1) situation awareness, (2) understanding the roles of other organizations, (3) generate alternative courses of action, (4) decision making, (5) communicate and share information, and (6) secure information management (Figure 2).

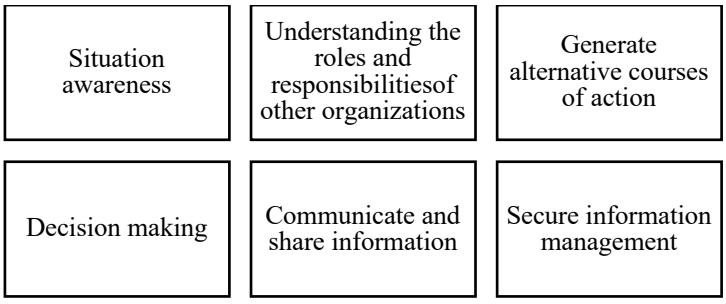

Figure 2. The six supportive capabilities that are significant building blocks of the core capabilities

Situation awareness

The capability of achieving *situation awareness* means being able to create and maintain an understanding of the situation. Situation awareness includes perception of environmental elements, comprehension of their meaning, and projection of their future status (Endsley, 1995). Situation awareness is critical for successful decision making in the context of ICM. Furthermore, common situation awareness is of great importance for all the core capabilities of ICM. One example of how a team can achieve common situation awareness is by compiling information from both own and other organizations into the common operational picture. The common operational picture could then be used during the creation of a common direction, coordination of activities and resources, and in the creation of a unified message to the public. Information sharing by information systems or by joint collaborative meetings supports a common situation awareness between all organizations in the ICM system.

Understanding the roles and responsibilities of other organizations

The capability of *understanding the roles and responsibilities of other organizations* means being able to create and maintain an understanding of other involved organizations in terms of roles, mandates, assignments, and resources. Understanding the other involved organizations' roles is significant in ICM settings (Hallberg, Hallberg, Granlund and Woltjer, 2014), as it is a prerequisite for both the development of a common direction and for coordination of activities and resources. For example, influences between organizations could be seen as a way to direct and coordinate (Bergström et al., 2016). In addition, understanding the roles and responsibilities of other organizations makes it easier to establish a common direction and gain an acceptance for the collective decision. Furthermore, understanding other organizations' roles and responsibilities increases the likelihood of other organizations offering help before asked for it, which, according to Dowell (2016), is a form of coordination.

Generate alternative courses of action

The capability to *generate alternative courses of action* means being able to create a set of possible courses of action to handle the situation. Being able to generate alternative courses of action is vital for the ICM system's ability to adapt in dynamically evolving situations, where the development of the situation may be difficult to predict. This capability demands the ability to generate creative, innovative, and flexible solutions to unpredictable events. Generation of alternative courses of action is a prerequisite for the creation of a common direction and coordination. This supports organizations to find the most suitable actions and prepare for situations they could not predict.

Decision making

The capability of *decision making* means being able to assess possible options and decide upon the most suitable actions, based on the situation. The capability to make decisions is central to inter-organizational collaboration (Dowell, 2016). The ability assumes that individuals are authorized by their organizations to make decisions. Due to the consequences that difficult decisions can have for individuals and communities, this ability requires a great deal of courage. Decision making is a prerequisite for the creation of common directions. Thus, creating a common direction is a decision making process where the best courses of action are selected. Decision making also has a vital role when deciding on a unified message for communicating with the public.

Communicate and share information

The capability to *communicate and share information* means being able to receive, collect, and share information. An important ability for accomplishing this is being able to establish and maintain social and technical networks (Kapucu, 2008). Communicating and sharing information is a necessary ability in order to understand what is happening, what can be done about it, and prompt organizations and additional resources to resolve the situation (Comfort, 2007). Therefore, communication and information sharing is a prerequisite for all the core capabilities. For example, information from all organizations is needed to establish a common operational picture. Moreover, the compiled operational picture contains information about the situation that should be shared by the organizations. This information is then vital for a common direction, coordination, and creation of a unified message to the public.

Secure information management

The capability of *secure information management* means ensuring confidentiality, integrity, and availability (CIA) when exchanging, processing, using, and storing information (Von Solms and Van Niekerk, 2013). Confidentiality means that information is not made available or disclosed to anyone unauthorized. Integrity means maintaining

and assuring accuracy and completeness of information. Availability means that information is accessible for those authorized when needed. Information can be both physical and digital, and it may be sensitive during a crisis. The triad of confidentiality, integrity, and availability is the core of information security. Secure information management is a prerequisite for the common operational picture to make it as reliable as possible.

Enabling capabilities

The enabling capabilities create the general conditions for inter-organizational collaboration. The four enabling capabilities are: (1) activate an inter-organizational crisis management, (2) coordinate the inter-organizational crisis management, (3) adjust the inter-organizational crisis management, and (4) dissolve the inter-organizational crisis management (Figure 3).

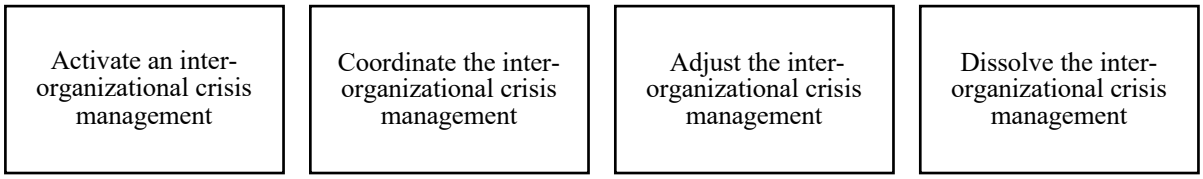

Figure 3. The four enabling capabilities.

Activate an inter-organizational crisis management

The capability to *activate an inter-organizational crisis management* means being able to initiate the ICM by alerting the relevant organizations. This is triggered by the decision that an ICM organization is needed. According to Dowell (2016), delayed activation of larger crisis responses could affect the outcome. Due to the nature of the situation, relevant organizations are contacted for participation. Hence, this capability aims to establish the conditions for the initial ICM.

Coordinate the inter-organizational crisis management

The capability to *coordinate the inter-organizational crisis management* means being able to coordinate, support, and plan the work that is carried out by the organizations involved in the ICM. Hence, this capability aims to maintain the conditions for the ICM.

Adjust the inter-organizational crisis management

The capability to *adjust the inter-organizational crisis management* means being able to adjust the conditions for the ICM to the development of the situation. This includes conforming the organizations involved and the way ICM activities are carried out. Due to the nature of the crisis, it is common for the situation to evolve over time, which means that the composition of the ICM might need to change over time. Furthermore, since crises and the way they develop are unpredictable, it must be possible to adjust the design of ICM collaboration according to the situation.

Dissolve the inter-organizational crisis management

The capability to *dissolve the inter-organizational crisis management* means being able to make the decision to discontinue the ICM when it is no longer needed and implement a decommissioning process. Hence, this capability aims to initiate and implement the process to end the ICM.

DISCUSSION

Exercises have been suggested as a means to ensure ICM capability (Borell and Eriksson, 2013). To be able to determine the level and progress of the capability there is a need for assessment approaches. However, the complexity of crisis management performance makes it difficult to measure the ICM capability. In other related domains, the complexity of a phenomena has been managed by creating more detailed descriptions. Greenberg et al. (2017) used 29 capabilities to describe the response capability to manage an oil spill. Comfort (2007) used cognition, communication, coordination, and control to explore CM. Granåsen et al. (2019) identified nine themes related to ICM capability. The set of 14 capabilities that can be used for understanding the inter-organizational aspect of CM presented in this paper is a further exploration of the themes in Granåsen et al (2019). There are overlaps where some of the themes were easily formulated into capabilities whereas others needed to be recreated

when new information was added.

All the 14 ICM capabilities that are presented in this paper are general, and thus applicable irrespective of utilized scenario, and divided into core, supportive and enabling capabilities. Core capabilities are defined as fundamental corner stones for ICM capability as they have a direct impact on the crisis system's performance. Supportive and enabling capabilities are a prerequisite for the ICM system to be operative and achieve core capabilities. The supportive capabilities can be regarded as building blocks for the core capabilities, whereas enabling capabilities provide general conditions for inter-organizational collaboration. Hence, all capabilities will have a direct or indirect impact on the CM performance. Consequently, if one, or several, core capabilities are not satisfactorily achieved, identification of the reason for this deficiency is largely facilitated by assessment and analysis of the supportive and enabling capabilities. Correspondingly, if one, or several, supportive or enabling capabilities are not satisfactorily achieved, the prerequisites for the ICM system to carry out successful ICM operations are poor. Thus, since assessment of the core capabilities is preferably performed by assessment and analysis of supportive and enabling capabilities, understanding the relations between these three categories of ICM capabilities is critical. The relations between supportive and core capabilities described in the results support this understanding.

The present paper presents a set of capabilities that constitute ICM capability, which enhance the possibility to analyze the effectiveness and performance of an ICM system. Based on the set of capabilities, the produced ICM capability may be assessed based on how well the more detailed capabilities are fulfilled, for instance, the timespan from the decision to initiate an ICM organization until it is operational and whether the ICM organization suggested to establish and share a common direction. The results provide an understanding of the areas in most need for improvement. Furthermore, the set of capabilities presented in this paper could be used as a foundation for designing capability-driven exercises (Eriksson and Hallberg, 2019). The focus on executed elements during the exercises is motivated by one or several capabilities.

Describing the ICM capability in more detail provides a deeper understanding of what needs to be assessed in ICM exercises. Hence, the design of exercises in terms of objectives, scenarios and assessments could be directed towards one or several of these capabilities. Since ICM exercises are costly and time consuming, using the ICM capabilities in the exercise design may support inclusion of relevant ICM capabilities in the scenarios, thus making sure that relevant ICM capabilities are actually trained and assessed. Although identification of proper methods to measure and assess respective ICM capability is extremely important this was not a part of this work, where the objective was limited to identify and elaborate a clearly defined set of ICM capabilities. However, methods for proper assessment of the capabilities is something that will be considered in future research. Some ICM capabilities are probably not possible to assess by direct observation during exercises, which means that combinations of several assessment methods will most likely be needed. Since the capabilities are general and of importance to practice in exercises they are also suitable for assessing real events. In these cases, other assessment methods will most likely be needed.

Foremost, the capabilities related to ICM presented in this paper are aimed for use in the context of the Swedish ICM system, which is characterized by a flat hierarchical structure and extensive autonomy for crisis management actors (Wimelius and Engberg, 2015). An important characteristic of Swedish CM organizations is their legal equality, which means that the coordination of the ICM system is performed through collaboration between different CM organizations and that a collaborative function is often formed. This aspect was taken into account, for example, in the formation of the *core capability* to *establish and share common direction*, which implies that organizations need to collaborate to identify keys for collective problem solving. In addition, the *enabling capabilities* imply that there is a certain function for activating, adjusting and dissolving the ICM system. This function could vary in the way it is performed and could therefore exist in various CM systems.

Even though the capabilities described in this paper focus on ICM capability, they are to some extent also relevant for single organizations. Several activities performed by single organizations are essential for ICM capability. For example, decision making is carried out on several levels both within organizations and in collaboration between several organizations. Moreover, a common direction or coordination needs to be executed through single organizations' chain of command.

The main contribution of this paper is the clearly defined set of ICM capabilities that could form the foundation for a future framework supporting the design of ICM exercises and the evaluation of participants' performance, e.g. corresponding to the framework suggested by Greenberg et al. (2017) in relation to oil spill response. A first step towards such a framework is to identify methods for measuring and evaluating the recognized capabilities and, thereafter, evaluate them empirically in ICM exercises.

CONCLUSION

In accordance with the objective, this paper provides a set of clearly defined capabilities that constitute ICM

capability. To enhance utilization of the presented capabilities, they were divided into core capabilities, supportive capabilities and enabling capabilities. The set of capabilities can be used to evaluate the performance of ICM, in CM exercises and in real CM operations. Furthermore, the set of capabilities could be used to design ICM exercises. Future work will focus on the development of a comprehensive framework that incorporates the identified capabilities and also provide methods and indicators for the assessment of each capability.

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