Boundary Stories - A Systems Perspective on Inter-organizational Learning from Crisis Response Exercises

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ABSTRACT

Inter-organizational exercises are commonly conducted with the aim to improve overall crisis response system performance. However, there are challenges associated with establishing learning goals for, designing and evaluating inter-organizational exercises. This work-in-progress paper applies a systems science perspective on the Swedish crisis response system with the aim to understand (1) what kind of a system it is (2) what properties or mechanisms enable good system performance?, and, (3) what are desirable training goals for improving the crisis response capability of the Swedish crisis response system? The author suggests that (1) the Swedish crisis response system can be seen as a Complex Adaptive System, and (2) that the focus must shift from exercising organizations' intra-organizational capabilities to adaptive capabilities. The latter can be achieved by designing exercises comprising boundary-crossing activities with the purpose to support the buildup of boundary-crossing competence. Cross-organizational learning can be achieved by identifying, documenting and disseminating boundary stories.

Keywords

Inter-organizational Learning, Boundary-crossing Competence, Boundary Discourse, Systems Science, Complex Adaptive Systems.

INTRODUCTION

The purpose for conducting inter-organizational exercises in crisis response is to enable learning in order to improve crisis response capability on a higher system level (Lalonde, 2004; Berlin and Carlström, 2014). From the individual actor's point of view, inter-organizational exercises thus aim to improve the understanding of the responsibilities and capabilities of own and other actors' responsibilities and capabilities, as well as the boundaries or interfaces that exist between the involved actors (Andersson, 2016). Thus, from a systems science (Checkland, 1999) point of view, inter-organizational exercises comprise desired cross-scale interactions; by focusing on events concerning organizational boundaries, the understanding of individual and others responsibilities and capabilities develop, affecting the emergent system capability on an overarching level.

Every real-world case of inter-organizational collaboration has unique features in terms of involved entities, their ability to collaborate, the dynamics and complexity of the event, and to what extent a crisis management support system that can empower the collaboration exists (Ansell, Boin and Keller, 2010). As pointed out by Majchrzak, Jarvenpaa and Baherzadeh (2014), one characteristic of inter-organizational collaboration is the dynamics in relations and the number of participating organizations, suggesting that exercises should not focus on exercising fixed structures or constellations of organizations, but rather on exercising generic aspects of inter-organizational collaboration. Comfort and Kapucu (2006) stated that "As the type and size of organizations involved in response operations varies, the disparity in skills, knowledge, access to information and equipment widens among the participants in the response process" (p. 310). They further declared that "The challenge to administrative theory and practice is how to design and support governmental systems that can adapt readily to the urgent demands and

complex operating conditions in extreme events" (p. 312). Improving the understanding of what the goals of inter-organizational exercises should focus on to actually improve crisis response capability is thus an important task in order to improve the design, conduct, and evaluation of such exercises. Nordström and Johansson (2019) conducted a review of inter-organizational crisis response exercise evaluation reports in a Swedish context. Several areas that could be improved in terms of evaluation reports content, how inter-organizational exercises are evaluated, and the lack of a technical support system for conducting exercise evaluation, were pointed out (Nordström and Johansson, 2019). Furthermore, the review suggested that there is a lack of theoretical understanding when it comes to learning in organizations, particularly in inter-organizational contexts. The purpose of this paper is to describe the Swedish crisis response system from a systems science perspective in order to discuss the following questions:

- What type of system is the Swedish crisis response system?
- What properties or mechanisms of such a system are important for overall system performance?
- What are the desirable training goals for improving the crisis response capability of the Swedish crisis response system?

This paper is not a literature review nor an empirical study. Rather, it is an exercise in applying systems science, learning theory, and communications theory to an existing system (the Swedish crisis response system). It is work in progress as the ideas and concepts outlined in the paper need to be applied and evaluated. The challenge of understanding and improving inter-organizational learning in a crisis response context demands such an approach as studies focusing on a limited set of questions or specific exercises are unable to capture the characteristics of the complexity of inter-organizational crisis response operations.

A SYSTEMS PERSPECTIVE

The term *system* can be used to denote several different things. As pointed out by von Bertalanffy (1968), there are at least three classes of systems: *real systems* which are observable, functional entities that can be viewed as systems, such as a human, a dog, a galaxy, or a machine; *conceptual systems*, such as mathematics, logic, and other essentially symbolic constructs; and lastly *abstracted systems*, which are a subclass of conceptual systems that correspond with reality (for example when modelling a real-world system) (von Bertalanffy, 1968). A systems perspective can be applied to *anything* and is therefore *nothing more than a perspective*. Adopting a systems perspective means defining the unit of analysis as well as accepting the fact that the concept of reductionism, i.e. that anything can be explained by understanding the parts that it consists of, is meaningless. Instead, a systems perspective means accepting that certain functions or qualities are *emergent on some levels of a system*, and that the *systems perspective is a way of thinking* rather than a discipline in its own right (Checkland, 1999). The system under scrutiny is in this sense *created* by the observer/analyst when he/she decides what the unit of analysis should be[1]. Systems science provides a language for the process of doing this and describing the system under scrutiny.

Defining the system is crucial in the sense that it comprises the task of stating what is – or is not - part(s) of the system, and what the boundary (our boundaries) of the system is. The existence (and identification) of a boundary makes it possible to define inputs and outputs, meaning information that enters or leave the system (Checkland, 1999, p. 101). This neat description is naturally hard to apply in reality, especially in a crisis response context where various entities[2] interact in unpredictable ways, forming and re-forming constellations of systems and sub-systems. It is therefore important to differentiate between *normative system perspectives* (systems as envisioned by their designers) and *descriptive system perspectives* (systems as they work in practice) (Brehmer, 2006). The former is a type of abstract systems that represent *work-as-imagined*, while the latter are real systems representing *work-as-done* (Carvalho, Righi, Huber, Lemos, Jatoba and Gomes, 2018). The consequence of this view is that although official descriptions of crisis response systems, to the extent that such exist, only provide information about a crisis response system as imagined, not as it actually works, particularly in previously unknown situations. General systems theory suggests that by studying many different cases, concepts, models and laws emerge that are valid across different types of sciences, systems and situations (von Bertalanffy, 1968). In order to do so, both the real system (the observable system), and as the abstracted system, the descriptions intended to depict the constellations formed to create a crisis response system, which also often drive the design of crisis response

[1] Von Bertalanffy stresses this point even further, stating that "perception is not a reflection of "real things" (whatever their metaphysical status), and knowledge is not a simple approximation to "truth" or "reality."' (1968, p. xxii).

[2] In this paper, "entity", "component", "node", etc are used interchangeably to denote functional parts of the system in question .However, in the discussion about the inter-organizational context of the Swedish crisis response system, it refers to organizations or representatives of organizations working in the field.

exercises and evaluations, will have to be considered. When doing so, it will be necessary to move across scales in the Swedish Crisis Response system, from discussing the *system-as-a-whole,* to discussing interactions that take place between a limited set of individuals in the field, in meeting rooms, and other physical places during a crisis. This approach thus postulate that the crisis response system as such is an emergent property aimed to create direction to the activities taking place, which emerge from the interactions between the involved entities.

THE SWEDISH CRISIS RESPONSE SYSTEM

The Swedish crisis response system is not *a* system per se as it does not have a common, purposefully designed structure or set of functions that provide basic functions such as planning, sensemaking, prioritization etc. Instead, it is a temporarily assembled construct composed by a variety of actors working according to a set of principles, directives and laws. Actors responsible for an operation in normal situations have corresponding operational responsibilities in the event of a crisis (Swe: ansvarsprincipen). A crisis must be managed where it occurs by those most closely affected and responsible (Swe: närhetsprincipen), and changes in the organization should not be greater than required to handle the crisis (Swe: likhetsprincipen). In addition to these principles authorities are obliged to cooperate with other authorities. The municipalities (local level) and the county administrative boards (regional level) should, within their geographical area, also work to achieve coordination between the crisis management measures taken by various actors during a crisis event (Swe: geografiskt områdesansvar) (prop 2005/06:133 p. 51; MSB, 2015).

Societal functions, what von Bertalanffy calls *the real system*, are distributed over a large number of agencies, organized in different ways and with different pre-conditions for participating in crisis response operations, and the participating organizations are likely to change over time. In order to achieve a coordinated response in a system like this, there need to be numerous interactions across organizational boundaries. Coordination, among this heterogeneous set of actors, needs to be based on collaboration as no organization has a clear mandate to direct the resources of another organization.

Consequently, from an analytical point of view, the Swedish Crisis Response system, can be seen as a *complex adaptive system* (CAS). As stated by Holland: "A complex adaptive system has no single governing equation, or rule, that controls the system. Instead, it has many, distributed, interacting parts, with little or nothing in the way of central control" (1992, p. 21). To be successful, a CAS needs to adapt to create a fitness to the context of its environment, be able to present variation to cope with change in the environment, and evolve to increase its fitness to the environment (Grisogono, 2006). CAS theory suggests that the ability of the system components to adjust their behaviour in relation to each other and the environment shapes the behaviour, and thus fitness, of the system as a whole (Holland, 2006).

Although the Swedish Crisis Response system works according to a set of principles, as described above, the initiation of the crisis response is almost always driven in a bottom-up fashion. This initiation can be manifested in many different ways, such as several local actors working on the same problem understanding that they need to coordinate their actions, to single organizations requesting help from others to cope with a situation. In either case, the participating organizations must adapt to both each other and the situation at hand, creating a global pattern of organization while simultaneously pursuing own and local goals (Bodin and Nohrstedt, 2016). This was described by Comfort and Kapucu as *auto-adaption*: "Auto-adaption is a form of mutual adjustment among the component units of an organization and, again, among the component organizations of an inter-organizational system" (Comfort and Kapucu, 2006, p. 316). This means that the actions of individuals in the field have the potential to alter the behaviour of an organization or even an inter-organizational system. This also means that the *crisis response CAS to a certain degree is self-organizing*, although there are laws and regulations to constrain and guide interaction. From a qualitative point of view, this auto-adaption is made possible by reciprocity and mutual trust, which allows members of different organizations to share information, risks, and opportunities (Kapucu, 2006). This view will be elaborated in the following sections of this paper by examining pre-requisites for interaction across organizational boundaries.

INTERACTIONS AS COMMUNICATION

From an analytical point of view, CAS theory suggests cross-scale interactions where local interactions between individual components in a system may affect the behaviour of the system as a whole. This also suggests that although a CAS like the Swedish Crisis Response system tends to create itself in unique ways in each new response, there are certain qualities related to the interactions between individual components of the system, such as interactions across organization boundaries that are common to all crisis response operations. A common feature of these interactions, at least in the context of Swedish crisis response, is that they largely consist of written or verbal communication. In the field, communication usually consists of verbal exchanges on site or shorter text messages. On higher inter-organizational levels, communication typically takes place at meetings or by formalized

types of written communications, such as reports or other types of documents, usually between designated points of contact. In either case, the communications that take place across organizational boundaries can be seen as a specific type of discourse that differentiates itself from the discourse taking place within the individual organizations. While communication on the abstraction level of systems concern information flows, which can be depicted by lines between system components, the author of this paper suggest that inter-organizational learning occurs on the boundaries in the form of dialogues, which can only be understood in the specific context where they take place. The communication that occurs between organizations involved in a crisis response organization reflects the quality of these interactions in terms of the knowledge, assumptions, definitions, etc that can be found in the discourse. *Discourse* consists of the conversations and texts that occur or are produced in specific contexts at certain points in time. Linell stated: "Any discourse or text is embedded in a *matrix of contexts* made up from an array of different *contextual resources*: prior discourse, concrete physical environments, people (and assumptions about people) with their interpersonal relations, various kinds of background knowledge, situation definitions (frames), models of topics talked about, etc" (Linell, 1998, p. 144).

Discourse, in the sense that it reflects knowledge held by different individuals belonging to certain groups, organizations, or social or cultural communities (Wenger, 1999), is not static. Rather, it is subject to constant change and can evolve and change rapidly. Interprofessional contacts at organizational boundaries, for example between individuals from different crisis response organizations, involve different perspectives, and ideological and culture- and profession-specific approaches to the crisis, which will trigger recontextualization of knowledge within and between the individuals. This often results in the emergence of a new type of discourse as well as changes to existing ones. According to Linell, this includes linguistic expressions, concepts, propositions, facts, lines of argumentation, values and ideologies, knowledge and theoretical constructs, ways of seeing things and ways of acting towards them, ways of thinking, and ways of saying things (Linell, 1998). To put it simply, the way individuals communicate about things changes the way they view things, and hence their ability to adapt to others. This in turn shapes the way they communicate about things, creating an ever-ongoing cycle of re-interpretation and recontextualization of discourse. In a way, communication constitutes a sensemaking process that guides understanding. Socio-cultural theorists have proposed that knowledge and learning are deeply rooted in language, and that a part of the learning process involves becoming socialized into the professional discourse (Wenger, 1999; Griffith and Guile, 2003; Walker and Nocon, 2007). Collaboration in a highly dynamic, uncertain and potentially dangerous situation naturally depends upon the ability to communicate efficiently. This goes beyond merely establishing technical means for communication. A vocabulary that is shared or at least agreed upon, trust, objectives that are shared to some degree, and commitment to contribute and adapt to both the situation and other actors are required.

LEARNING GOALS IN AN INTER-ORGANIZATIONAL CRISIS RESPONSE CONTEXT

From the point of view of learning, on the micro-level, an important goal of inter-organizational exercises is to create a new discourse at the boundaries of organizations in inter-organizational crisis response operations. Walker and Nocon (2007) suggested that a *boundary-crossing competence* is needed to function competently in multiple contexts, something referred to as a 'broader ability' by Berlin and Carlström (2015, p. 20). A boundary-crossing competence is needed to adapt smoothly to the wide range of actors that may be encountered by individuals working in an inter-organizational crisis response context. Walker and Nocon further suggested that learning environments must offer learners the opportunity to participate in horizontal – rather than vertical – systems of expertise (Walker and Nocon, 2007). They argued for an expanded notion of competence that "encompass the ability to manage and integrate multiple, divergent discourses and practices across social boundaries" (Walker and Nocon, 2007, p. 181). Griffith and Guile took a similar stance: "...it forces a recognition that learners have to be supported to overcome the situatedness of knowledge and skill so that they can develop the dialogic capabilities to participate in the discourse associated with different workplace communities of practice" (Griffith and Guile, 2003, p. 67).

From the point of view of crisis response, knowledge within organizations is often recontextualized vertically, i.e. knowledge is applied in a similar fashion in different contexts, such as writing, where a student who has learned how to write can apply this skill both by using a pencil or a keyboard. Horizontal recontextualization on the other hand involves defining new contexts, new goals, and activity patterns – referred to as *expansive learning* by Kerosuo and Toivianen (2011). Interaction across boundaries requires the construction or transformation of new knowledge, identities and skills rather than only taking advantage of constructs transported from other contexts, as in vertical recontextualization (Griffith and Guile, 2003). Thus, a specific discourse seems to emerge and exist at the boundaries between organizations, a *boundary discourse*. This boundary discourse is the product of vertical recontextualization of concepts, terms, propositions, facts, argumentation, etc on the behalf of the individuals interacting across the boundaries of the involved organizations.

However, this boundary discourse is not limited to the inter-organizational boundaries – eventually it will

influence intra-organizational discourse and the individuals working on the boundaries will partake in the discourse within their own organizations. Individuals working at and across boundaries can be viewed as a type of *brokers* (Wenger, 1999) or *boundary spanners* (Kapucu, 2006) as they, at least implicitly, have the task to build bridges across organizational boundaries. Wenger described the job of a broker as complex as it "involves processes of translation, coordination, and alignment between perspectives" (Wenger, 1999, p. 109). This means that individuals taking on the role of boundary crossing may be held accountable by the organizations, creating an ambiguity concerning their loyalties and eventually organizational or group belonging (Akkerman and Bakker, 2011): "On the one hand, these people and objects enact the boundary by addressing and articulating the multiple meanings and perspectives following from sociocultural diversity (representing both-and). At the same time, boundary objects and boundary-crossing people move beyond the boundary since they are not fully defined by the multivoicedness but rather are in a middle ground and have an often unspecified quality of their own (neither-nor)" (Akkerman and Bakker, 2011, p. 150).

Nonetheless, individuals possessing boundary-crossing competence have a crucial role in the adaptive process between organizations if a CAS perspective is applied. Successful development of a boundary discourse may eventually lead to reformulation of organizational boundaries, thus fundamentally changing the systems-as-a-whole. Inter-organizational exercises must therefore encourage the development of such competence in order to strengthen the overall capability of the crisis response system. However, in order to deepen the understanding of what this competence means and how it can be encouraged, the concept of boundaries needs to be further investigated. Wenger (1999) suggested that learning consists of the components *practice*, *identity*, *community*, and *meaning*. From Wenger's point of view, learning is tightly interwoven with the learner's community. From an intra-organizational point of view, this is fairly straightforward. However, in an inter-organizational context, problems arise as the components community and identity become blurted and vague as there is no apparent community of practice, and hence no professional identity to recognize and pursue as a learner.

Boundaries, as used in this paper, is an ambiguous term. Being at the boundary of an organization suggest belonging to a world and another world, i.e. being in the in between. The boundary does not only include/exclude, it is also where the organization *connects* to other organizations. The boundary both define what someone or something belongs to, and thus in sense *is*, but also what it *is not* (Akkerman and Bakker, 2011). Boundaries are challenging to the adaptive capacity of systems consisting of several organizations as they present "socio-cultural differences leading to discontinuity in action or interaction" (Akkerman and Bakker, 2011b, p. 1). The individuals working at and across a boundary enact the boundary by addressing and articulating meaning and perspectives on the intersecting organizations, and they also partake in the creation of a new discourse with the potential to change or redefine the boundaries. Boundaries are not stable constructions; instead they are precarious and permeable in nature (Kerosuo, 2001). Inter-organizational exercises, at least when they encourage interaction at the boundaries, therefore have the potential to support the creation of new concepts, terms, facts, and lines of argumentation that support the buildup of boundary crossing competence and hence improved adaptive capability of the system-as-a-whole. This should not be interpreted as dissolving the boundaries as such – the interacting organizations will most likely not merge into a new organization although some practices may converge. "Dialogical engagement at the boundary does not mean a fusion of the intersecting social worlds or as dissolving the boundary. Hence, boundary crossing should not be seen as a process of moving from initial diversity and multiplicity to homogeneity and unity but rather as a process of establishing continuity in a situation of sociocultural difference" (Akkerman and Bakker, 2011, p. 152). It should be noted that boundary work may lead to the development of entirely new practices in their own right (Wenger, 1999), potentially taking the form of a new organization, or node, in the system-as-a-whole.

An important learning goal of inter-organizational exercises should therefore be to create this boundary crossing competence and ultimately to develop a boundary discourse that supports adaption within the crisis response system. This is reflected in exercise objectives in various ways. For example, in the review of inter-organizational exercises by Nordström and Johansson (2018), typical learning goals were "That actors have a good ability to communicate internally and externally, as well as explain the decisions taken and their consequences" (p. 5, original in italics). However, the review also analyzed the type of indicators used for evaluating exercises, and concluded that indicators usually reflect easily assessed aspects of communication such as time to establish technical communication systems, number of meetings conducted, timeliness of written reports etc. This suggests that indicators usually grasp for *what is measurable* rather than *what should be measured.*

Suggestions for creating and capturing discourse at the boundaries of organization

How should the type of knowledge, or discourse, created at inter-organizational boundaries during exercises or actual crisis response events be captured? How can it be used to recontextualize concepts, terms, and lines of argumentation – the way people think – within organizations? Snowden suggested that the most promising approach to capturing knowledge in organizations is to engage in capturing and disseminating stories and

anecdotes that can assist in contextualizing new knowledge and recontextualizing existing knowledge. He stated that anecdotal material is highly valuable as it offers material for story construction, which is a way to turn complex ideas and concepts into a memorable form and embed sustainable lessons learnt (Snowden, 2000). Snowden further suggested the creation of *archetypes*, cartoon-like characters that reflect important properties of different members in an organization, as a point of departure for the creation of new stories or scenarios that can support learning and organizational memory. Archetypes, such as the hero, the wise old man, the villain etc have always existed, but they also exist within organizations. All workplaces have a few iconic co-workers who occur in coffee-room discussions, around whom stories emerge and are recontextualised as time passes. New discourse can be created between and about the archetypes. Snowden (2000, p. 61) stated "…the experience of past employees can be captured in a memorable form; they allow induction time to be shorted by giving employees access to stories that it might otherwise take them months or years to accumulate […] to explore alternative views, or investigate likely responses to a situation from different viewpoints". The author of this paper suggests that this approach can be particularly promising for capturing and increasing knowledge in an inter-organizational context. Stories from work occurring at and across organizational boundaries have the potential to illustrate fundamental aspects of such work, but also to support recontextualization of knowledge and practices by providing examples of what works and what does not. Archetypes can be used to support the build-up of identity for boundary spanners. Conversely, other archetypes could highlight what kind of behaviours do not comply with boundary spanning competence.

Hence, rather than focusing on easily measurable indicators as the assessment of a complex event such as an inter-organizational exercise, less tangible but useful data should be collected, such as narratives about success or failure. Snowden suggested *Story Circles*, a kind of workshop where stakeholders meet, discuss, take notes and elicit new points of view and new concepts. This method allows "a degree of phase shift: dialog would appear meaningless for long periods and then suddenly meaning would emerge in the form of a memorable phrase" (Snowden, 2000, p. 58). This lead to "a breakdown of existing perceptions and beliefs and resulted in new insights that *emerged* from the active discourse of informed participants […] meaning had arisen from the community itself, but only where the environment had changed to create discomfort and disruption" (Snowden, 2000, p. 58). As described above, discomfort and disruptions are characteristics of boundaries, which would support the idea that facilitating storytelling about boundary work could benefit the creation of *boundary stories*, and the creation of archetypes illustrating boundary-crossing competence.

DISCUSSION – IMPLICATIONS FOR INTER-ORGANIZATIONAL LEARNING IN CRISIS RESPONSE

It is sometimes argued that inter-organizational exercises are an expensive waste of time. This line of reasoning is often based on the difficulties to establish a connection between exercises and real-event performance. In this paper, the author argues against this view. Inter-organizational exercises are one of very few situations where actors in different organizations have the opportunity to interact across boundaries with the purpose to cope with a shared problem. It is only at these times that boundary discourse can emerge. However, this also puts demands on the designers and evaluators of inter-organizational exercises; it must be assured that the exercise not only focuses on training goals associated with the individual organizations. The lack of predictability in crisis response operations suggests that it will always be difficult to know with whom one should cooperate, especially in crisis response systems like the Swedish one, where responsibilities and mandates are widely disseminated. Instead, focus should be on generic collaborative capabilities where exercises are designed to challenge participating organizations in such a fundamental way that boundary-crossing interactions are needed to cope with the problem at hand (Berlin and Carlström, 2015). Evaluations, likewise, need to focus on events concerning the boundaries of the participating organizations to assure that the evaluation captures aspects of interaction between and adaption of participating organizations. Unfortunately, many inter-organizational exercises are streamlined to provide "value" to all participating organizations by assuring that everyone has the opportunity to show off their professionalism (and hence experience "success" during the exercise). Focus thus often lies on drill of skill rather than collaboration. This creates a situation where the assessment of the system-as-a-whole actually consists of an aggregation of the individual capabilities of participating organizations rather than the adaptive capability of the same organizations. This type of approach is most likely a heritage of the reductionist view on systems, where a basic assumption is that performance of a system can be described and understood by studying the capabilities or behaviours of the individual system components. This is, however, a dangerous approach, particularly when discussing a CAS like the Swedish crisis response system. Von Bertalanffy (1968, p. 10) warned that "man in the Big System is to be- and to a large extent has become- a moron, button-pusher or learned idiot, that is, highly trained in some narrow specialization but otherwise a mere part of the machine". Likewise, Comfort and Kapucu (2006) describes specialization as unsuitable for auto-adaption. Understanding and improving crisis response capability can only be achieved by embracing the uniqueness and complexity of crisis response operations and exercises, and by acknowledging the fact that system performance on the macro-level is an emergent effect of interactions that take place on the micro-level between rather than within system components.

Understanding the qualitative underpinnings of interactions between components in a CAS in the *real system* is therefore crucial, as establishing information paths, as described when departing from the *abstract,* or even *abstract normative system description*, often is suggested as the solution to coordination problems. Abstract and normative descriptions of a system usually only capture the communication channels rather than the actual communication. Weaver (1953) was aware of this as he divided the challenge of mediated communication into three different levels, (1) transmitting symbols (through a technical system) in such a way that they are possible to decode, (2) the semantic challenge, i.e. how well the symbols convey the desired meaning of a message, and, (3) the efficiency challenge – does the message affect the receiver in the intended way? (Weaver, 1953). In systems science, communication is usually described and discussed according to the first level of Weaver, hiding qualitative aspects such as trust, shared terminology, lines of argumentation, recontextualization etc., things that actually support the adaptive mechanisms of a CAS. This paper advocates richer ways of describing and depicting the communicative links between different organizations if an improvement of our understanding of the cross-scale interactions that take place in a crisis response system is to be achieved. Understanding of inter-organizational work or cross-organizational learning cannot truly be understood or developed by reducing complex systems to snapshots of information paths.

CONCLUSION

To conclude, inter-organizational exercises are important in order to support the development of boundary discourse and boundary crossing competence. To achieve this, inter-organizational exercises need to be designed in such a way that they enforce boundary-crossing activities in connection with challenging problems that demand coordination and joint problem solving. While skill development, in the sense of increasing professionalism, is still valid from an intra-organizational point of view, evaluations of inter-organizational exercises must comprise not only of assessing indicators, but also on collecting boundary stories – stories illustrating the do's and don'ts of boundary work. Boundary stories must embrace tensions and disruptions in inter-organizational work. These are unavoidable issues in inter-organizational contexts, but also potential learning events. Extensive joint after action review and debriefing sessions are important enablers for identifying and collecting such stories. Assuring that such sessions are joint, comprising several organizations, is crucial as the stories need to include narratives that are found relevant by several involved organizations, i.e. they should possess a general quality that can be recognised by many different actors in the crisis response domain, thereby supporting cross-organizational learning. By disseminating such stories within and between organizations within the crisis response system, it may be possible to improve the adaptive capacity of the very same organizations. From a research point of view, this suggests that there is a need to analyze the discourse occurring during boundary-crossing activities in order to improve the understanding of boundary-crossing competence and the factors that promote it. The discourse that emerges at the boundaries of organizations is a powerful resource that can be exploited as it supports not only talking about the world, but also acting in the world.

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