LEARNING IN A FRAGMENTED EMERGENCY RESPONSE ROOM IN THE CITY OF AMSTERDAM

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ABSTRACT

During the last decades there has been a lot of attention to issues of safety, emergency response and crisis management. Emergency response rooms (ERRs) are interesting public sector organizational arrangements in this respect. In our paper we pay attention to emergency response rooms in the Netherlands and especially in Amsterdam. Using an ethnographic approach, we studied the fire brigades (red), the medical services (white) and the police (blue) including their back-office organizations, their habits, and the systems in-use. As could be predicted, the (technical) integration of ERR systems in the Netherlands was not unproblematic. In our contribution we will make clear that the organization of the safety response in Amsterdam is rather fragmented. The latest discussion in the field is about the introduction of net-centric work, a concept based upon the interactive internet 2.0. Yet, it is not so much the technology, as well as the institutional arrangements that are at stake.

Keywords

Emergency response rooms, integrated systems and learning, ICT systems in-use, ethnographic case-study

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1. Introduction

Worldwide there has been a lot of attention to issues of (national, urban) safety, security, emergency response and crisis management during the last decades. Safety became a hot topic not in the last place because of the terrorists attacks that took place, such as the attacks at 9/11 in the U.S.A. in 2001, the attacks in Europe (Madrid in 2004 and London in 2005), and Asia (for example in Bali in 2002). Unsurprisingly, the organization and management of safety and emergency response systems has been an emerging area of interest to both academics and practitioners over the past few years (Cooper, 2000; Bannister & Fyfe, 2001).

Against the backdrop of issues of crisis and incidents, the most interesting question for organization and administrative scientists (and practitioners) is how to *organize* the 'resilience' of the social system under risk. We can see nowadays that the transformation of the geography of the social fabric, the public and private partnerships and the introduction of information and communication technology (ICT), have influenced not only policing, but also the providing of safety and security by means of 'hybrid' organizational bodies and networks of security meaning mixed public – private; connections between professionals and volunteers; centrally guide – decentralized.

Quite a few studies have dealt with various aspects after the attacks on 9/11 and the hurricane Katrina. Examples are studies that deal with national responses to the lack of connection between planning and operational capacity (McConnell & Drennan, 2006), or the effects of training for improving preparedness of emergency responders (Perry, 2004). While protocol and preparation receives a lot of attention relatively few studies deal with the organizational dimension, i.e. what organizations, cooperations and actions can be drawn upon in case of emergencies. In the literature, *Emergency Operating Centers* (EOCs) are seen as essential public sector organizational arrangements to be considered in the discussion on safety governance and management (Perry 2003).

Emergency Response Rooms (ERRs) play a role in connecting EOCs to first responders in the field as these operations are increasingly build around information and communication technology. It is the personnel of the ERRs that can contribute in many ways to the resilience of the social system. They (the operators) conduct the intake of 911 (North America) or 112 (Europe) for help, and relay them to EOCs and

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the appropriate services. Consequently ERRs play a critical role in responding and mitigation before EOCs come into operation. Yet, the international literature on emergency response rooms seems to ignore the social and organizational issues with regard ERRs. Moreover, more research into the safety response ICT-systems *in-use* (Orlikowski, 2000) in relation to the organizational aspects of ERRs is necessary to understand how emergency response rooms actually work.

The research question in this article is how the ERRs are embedded within broader organizational configurations and how the main actors – the operators - give meaning to the ERRs, how these actors make use of the information systems and how they learn in and about these settings. We will present an ethnographic case-study on the Amsterdam ERRs, and their ICT systems-in-use and will discuss how they are embedded in wider safety systems including those of the city of Amsterdam and the safety region(s) in which they are located.

2. Safety Policy in the Netherlands and the Role of Emergency Response Rooms

The Netherlands is not an exception when it comes to discussions about urban safety and safety measures. Since the terrorist attacks at 9/11 in the United States, discussions on safety and the resilience of the safety-system abound in the Netherlands (Helsloot 2007). And as a matter of fact, the international, global developments are dominating the safety discourse in the Netherlands. It is not only the international terrorist threat, however, that gives rise for concern about safety issues. Recent national traumas, such as the explosion in the firework factory in May 2000 in the town of Enschede that killed 23 people and injured about 950, and the fire in a Volendam café at New Years Eve 2001 that killed 14 teenagers and injured about 180, put safety and the governance of safety on top of the political agenda.

As a reaction to the firework-incident in Enschede the Dutch government installed an independent committee to investigate how such a disastrous explosion could have happened and how the safety-organizations – the fire brigades (red), the medical services (white) and the police (blue) - including, respectively, their back-office organizations functioned at the time of the disaster. The committee concluded, among other things, that the communication between the several safety-organizations failed at the time of the incident (Commissie Onderzoek Vuurwerkramp

[Investigation Committee Fireworks-incident] 2001). The committee also concluded that the back-offices of the organizations did not meet the expectations.

It was especially the communication in and between the emergency response rooms – the committee uses the term 'nerve center' for these organizations – that failed at the time of the explosion and in the direct aftermath of the incident. This conclusion was repeated in a report that was made as a reflection on a major crisis exercise 'Bonfire' that was held in Amsterdam in 2005 (COT 2005, 23). On the one hand it is easy to incorporate the weak communication in and between emergency response rooms into the dominant discourse on safety. On the other hand, however, it is interesting to make a more in-dept organizational analysis of the emergency response rooms to understand how they actually work and how they are embedded in the wider (urban) safety-organization.

2.1. Emergency response rooms in the Netherlands

Emergency response rooms located in urban regions are interesting public sector organizational arrangements to be considered in the discussion on safety governance and management (Perry 1995). It is the emergency response room that can contribute in many ways to the resilience of the urban system. They (their operators/centralists) conduct the intake of 911-calls (in the Netherlands: 1-1-2) for help, and relay them to the appropriate services: red, white and blue. Thus far, local policy makers and other practitioners have focused on such issues as the integration of information systems and the implementation of promising information and communication technologies in the rooms. And in the scientific literature scholars analyzed communication and information sharing practices within emergency rooms in terms of e-governance and governmental performance management (Schooley and Horan 2007). Not surprisingly, a great deal of the literature on emergency response systems has been on technical issues, and the effectiveness of the information and communication systems that have been implemented at the emergency response rooms.

However, the international literature on emergency response rooms is still scarce and, moreover, seems to ignore the organizational issues and how these centers are embedded within the city and the wider region. And with regard to the information and communication systems, research into the actual use of these systems (Orlikowski 2000) is still necessary to understand the impact of ICT on security organizations such as the emergency response rooms.

In the sections below, we will focus upon the organization of the emergency response rooms in the city of Amsterdam. We will present a case about the Amsterdam emergency response rooms, their systems-in-use and will discuss how they are embedded in wider safety systems including those of the city of Amsterdam and the safety region(s) in which they are located.

3. Approach: Research Agenda and Methods

This paper is the result of a literature review and an in-dept empirical study (including site-visits, interviews and observations) on emergency response rooms in the city of Amsterdam. We found Weick's concept of sensemaking particularly helpful in this approach. For Weick (1995: 6), sensemaking is about '…such things as placement of items into frameworks, comprehending, redressing surprise, constructing meaning, interacting in pursuit of mutual understanding and patterning.' This approach does not come with a clear-cut set of methods. Instead, our research-design takes the form of multiple sources of qualitative and some quantitative data.

First of all, we interviewed key-persons at the three emergency response rooms and the representative of the safety region Amsterdam-Amstelland. The latter is also involved in safety-policy of the municipality of Amsterdam. We interviewed the heads, (a selection of) the middle managers and the operators of the three emergency response rooms. In the interviews we asked the respondents about the organizational management, the work-routines of the operators, the communication and other interaction between members of the three emergency response rooms and finally about the emergency response room systems in-use. We also interviewed the heads and/or co-workers of the ICT-service centers of the emergency response rooms. In order to understand the ICT-systems that are installed, we videotaped the three emergency response rooms while the systems were in use.

In the second place, we participated in the project 'Improving the Multidisciplinary Informationmanagement' in December 2007 and January - June 2008 headed by the fire department Amsterdam. In this project we did research together with practitioners in Amsterdam with whom we took several site-visits to the three separate emergency response rooms. The main goal of these site-visits was to investigate the quality of the communication in and between the emergency response rooms. We actively participated at the (evaluating) meetings of the project-team and

contributed to the reporting of the committee. During this period, we also participated at one multi-disciplinary field exercise in Amsterdam. The research we undertook can be described as *action research* (Reason and Bradbury 2001), which brings together action and reflection and theory and practice in a specific context of application and in cooperation with practitioners (Gustavsen 2003).

Finally, in order to gain a better understanding of the broader context in which the emergency response rooms are situated we analysed additional, written material. The documents reviewed were diverse and included, among others, 'official' documents and policy papers produced by the Dutch government, local (Amsterdam) policy-makers and by representatives of the three disciplines. Most of the documents came from the emergency response room organizations itself and from their websites. Documents written about the organization were also reviewed, including newspaper articles and other media-related information, which provided us with important input for the reconstruction of the position of the emergency response rooms in the Dutch urban safety policy.

4. The Emergency Response Rooms in Action: (Re)Organization, ICT and City-management

In the aftermath of incidents such as in Enschede and Volendam to which we referred to in the introduction of this paper, steps have been taken to physically house the three disciplines' (fire brigades, the medical services and the police) emergency response rooms' personnel at one site. Such a new emergency response room, which houses the three disciplines, is known as a 'co-location' or a 'co-located' emergency response room. The idea to put the members of the different response rooms together is understandable, since communication between members of a team becomes more problematic if the team is physically distributed (Hinds and Bailey 2003).

The promising idea was that the communication between the operators/centralists of the three disciplines – who operate in isolation from each other, but who become a 'team' in case of a major incident - would be improved by means of the co-location. The idea also was that such a new setting would result into learning preactices and/or a 'learning organization'. Parallel to this initiative, new technical systems have been introduced to facilitate the communication in and

between the operators/centralists in the rooms and between the operators and the servants in the field.

As could be predicted, the (technical) integration of emergency response systems in the Netherlands was not an unproblematic matter (Groenewegen and Wagenaar 2006; Wagenaar, Boersma, Groenewegen and Niemantsverdriet 2008). Three aspects are important to consider studying the reorganization and mergers of emergency response rooms in the context of safety policy and in relation to learning processes. These aspects, on which we will elaborate below, (partly) predict the success/failure of the emergency response rooms as an organization:

1) the different backgrounds and identities of the three disciplines,
2) the relation between the emergency response rooms, the city/municipality-management and the Dutch safety-regions,
3) the implementation of new technologies in the rooms.

4.1. Red, white and blue: cultural differences…

It is important to realize that the integration of emergency response rooms implied a merger of three different organizations and organizational routines. A study by Stinchcomb and Ordaz on the integration of emergency response rooms in Florida, USA, indicates that it is important to consider the cultural dimension of the organizations and the identities of the people involved (Stinchcomb and Ordaz 2007). And indeed, during our empirical work, we found that the three different disciplines of red, white and blue have different professional needs, habits and work routines.

For the fire brigades (red), to begin with, the emergency response room functions primarily as a first service-hatch. If the fire brigade is involved during any incident the officer in the field will take the lead – after all, he or she is best able to evaluate the risk. A respondent of the medical emergency response room literally told us: '…if an incident becomes interdisciplinary, it immediately becomes a fire brigade show…'. For the operators in the emergency response room it is important to translate the information that comes from the field – the place of incident – in order to pass it on to the other disciplines. Equally important for them is that they have to communicate situations during which the officer in the field decides that the incident is so big that 'upscaling' is necessary. Upscaling in this respect means the involvement of other municipalities, disciplines or safety-regions. In case of upscaling

the *Regional Incident Procedures* (the Dutch abbreviation is '*GRIP*') is the leading protocol.

In contrast to the operators/centralists of the fire brigades and the police, those of the medical services (white) have to be able to evaluate the medical condition of a casualty on the street at the time of an incident. For this reason it is required for the operator/centralist to hold a paramedical training on Bachelor-level. At the time of an incident the operator also keeps in touch with the ambulances in the field via the communication systems. For the understanding of the routines of the 'white' operators it is important to realize that they are not only responsible for the communication between victim and ambulances. During their work it is their task to not only take care of the 1-1-2 emergency-calls, but also to organize the logistics of the ambulances for planned patient transport, for example the transport of a patient from one hospital to another or from the hospital to the patient's house. This implies that the operators are constantly occupied with and planning the availability of ambulances. The privatization of ambulance service in the Netherlands makes the situation even more difficult, since operators have to deal with different organizations.

To the operators of the police (blue), finally, is it important to understand the work and routines of officers in the field. The police emergency response room, more than those of the other two disciplines, functions as a 'control tower', which means that the operators (must) have a helicopter-view. The police officers and police cars are in the field on a permanent basis; in contrast to, for example, the fire engines, which are − most of the time − stand-by at the various fire stations. Although electronic city and regional maps, such as CityGIS are also important for the medical and fire brigades, for the operators of the policy, this programme is crucial. 'GIS' in CityGIS stands for Geographic Information Systems and is a database in which entities are spatially indexed and which is used for all kinds of policing (see: Snellen 2000). CityGIS has been in use in Amsterdam from the mid-1990s not in the first place for safety-issues, but for public information service about local real estate information, and to enhance transparency of local policy procedures and regulations (Lips, Boogers and Weterings 2000). Today it is a crucial device for the police − and more recently also for the fire brigade and the medical services − to operate, to orientate themselves and to locate their colleagues.

4.2. ...in relation to city management and safety-regions policy...

For the understanding of the organization of urban safety, it is crucial to look at the way the emergency response rooms are related to the city/municipality-management and the safety-regions. In 2007 the Dutch government introduced 25 different safety-regions as part of the national reorganization of safety agencies (see figure 1).
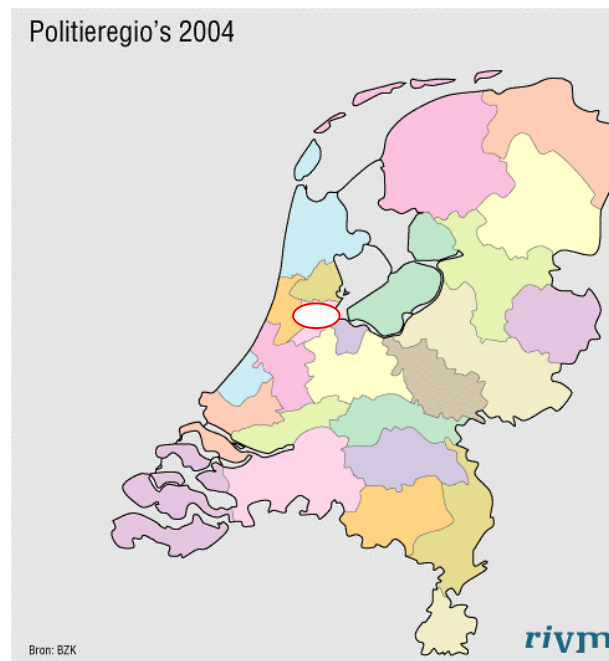

Figure 1: Safety regions in the Netherlands.

Source: http://www.rampenhulpverlening.nl/vbd/vbdveiligheidsregios.html (the white oval points out the safety-region *Amsterdam-Amstelland* and is our addition to the figure).

Amsterdam is the most important city in the safety-region Amsterdam-Amstelland. One of the effects of the introduction of the safety-regions has been the 'co-location' of the emergency response rooms. The 'co-location', as we already mentioned, means that the emergency response rooms of the three disciplines involved are housed in the same room. Interesting enough, the Dutch capital city Amsterdam (the central city of one of the 25 safety-regions) is the only city in the Netherlands in which the three disciplines are still located on separate locations spread over the city. The discussion about co-location in Amsterdam was and still is not an unproblematic issue. In the public report on 'Physical Safety' (2004) of the municipality of Amsterdam we can read:

'The cooperation between the emergency response rooms of the three different disciplines can be improved. This can be gathered from the report 'Co-locatie meldkamers Amsterdam en omstreken, 2003' [Co-location emergency response rooms Amsterdam and its surroundings]. The coordination will be improved on the basis of the VCMC-model (the Virtual Co-location with Coordination).' (Source: Directie Openbare Orde en Veiligheid Gemeente Amsterdam 2004, cit. p.22; translation by the authors).

Probably the most interesting topic in the study (and governance) of co-located emergency response rooms is the phenomenon of 'upscaling', which means cooperating with other disciplines, and even other safety-regions in the case of large-scale emergencies. This refers to the 'GRIP' situations mentioned previously in this article (see also: Van der Doorn, Van Santen en Bolten 2001, p. 70). The pressing question is whether a specialized emergency response room per discipline on a higher scale wouldn't be the most logical solution to large-scale safety problems, as emergency response rooms fulfill a different function for each discipline.

Safety-regions often have geographical boundaries that are illogical in case of large-scale emergencies. A disaster at Schiphol airport, situated close to Amsterdam, would be the most striking example. The responsibility for Schiphol's safety has been a controversial issue in Dutch politics for years. Schiphol is part of the Haarlemmermeer municipality, which is outside of the Amsterdam-Amstelland safety-region, and, since 2008, fully part of the safety-region Kennemerland (Remkes 2006). The process to include Schiphol into the safety-region Kennemerland took place not without a strong opposition of the major of Amsterdam. Although the decision has been made by the central government in the Hague to include Schiphol into Kennemerland, it is still argued that the safety region Kennemerland is probably too small to handle a large-scale disaster at Schiphol. Therefore, at the moment, the possibility of a merger between the safety-regions Amsterdam-Amstelland, Kennemerland and Zaanstreek-Waterland (another neighboring safety-region) is being researched. In anticipation of this (possible) merger, many decision about investments (e.g. in new information systems for the emergency response rooms) have been postponed or, as one respondent reflected, put forward as an excuse not to invest into the organization at all. The discussion about the (re)organization of the

safety-regions in the Netherlands is, as this example illustrates, a debate about the allocation of tasks and responsibilities, which makes it a political sensitive issue.

4.3. ... and with new, emergency response rooms systems in-use

It is necessary to consider how the (re) organization of the ERR went hand in hand with the implementation of new technologies such as communication devices and information and communication tools. Reorganizing the ERRs also meant reorganizing work-processes, as an effect of the introduction of new, large-scale, information systems.

In reaction the earlier mentioned airplane crash in Amsterdam the Dutch cabinet decided in 1995 to implement a single national communications network for the police, the fire brigades and the first aid teams. It was to be called C2000 (communication 2000). C2000 is a digital radio network for public safety and is part of the comprehensive approach to safety and supports ERR operations, of which the ERR software GMS (integrated emergency response room system) usually is an essential part. GMS is software meant to connect the different sources of information in the back-office of the ERRs. Although GMS was introduced on a national basis, the management of the ERRs could decide for themselves if and how to implement the system in their organization. Moreover, GMS could be tailored to the various needs and requests of the operators/centralists of the individual response rooms. As a result, there are many different versions of GMS in operation and − maybe more problematic − some ERRs still work with other systems.

The latest development in ICT-implementation and ERRs is the national proposed introduction of *netcentric work* Based upon web 2.0 technology. In relation to emergency response the promise is that the ERR personnel not only collect real-time information about a certain incident from the professionals in the field but from other sources (i.e. citizens) as well; without the restraints of formal organization. Netcentric work, in technical terms, is based upon the idea of network-enabled capability (NEC), which '…constitutes an *enabler* of effects-based operations both at the level of command and control, and at the level of operational capability.' (Von Lubitz et al., 2008: 10).

What is anticipated on with the introduction of NEC is not so much an implementation of a new technical device but, as our respondent of the Dutch Ministry of Domestic Affairs told us, a *paradigm shift*. The idea to introduce

netcentric work in Amsterdam is part of an intervention by the Ministry of Domestic Affairs in the Netherlands. The promise is that netcentric work can provide operators with a view of each other's worlds. Yet, besides the always problematic implementation trajectories of such huge projects, an unintended consequence might also be adding at least one extra organizational layer to the ERRs, as additional personnel will be needed to validate the information in the netcentric environment.

5. Emergency Response Rooms in Amsterdam City

Although there is little reference to the emergency response rooms in official reports, they play a major role in the whole organization of safety in the city of Amsterdam. As we said, the emergency response rooms in Amsterdam are not co-located (yet). The most important question in the current debate is whether the 'co-located' emergency response rooms really should play a role in integrating the disciplines, as the personnel present mainly does the coordination on the site of an incident. The coordination involves also the cooperation of the three disciplines.

As a matter of fact, the three disciplines each have their own emergency response room at different spots in the Amsterdam city. Besides, the information systems these separate emergency response rooms use are not (yet?) electronically connected. In some instances systems even differ between emergency response rooms. The 'white' emergency response room, to give but an example, works with a system called 'MIOS', which it has developed itself. In the daily practice of the emergency response organization this means that the information (as laid down in the systems) is not shared among the different rooms. Not co-locating the Amsterdam emergency response rooms has been a political decision, heavily influenced by the discussions about safety at Schiphol airport. From a political point of view it is argued that the discussion about the merging of the three safety-regions in the Amsterdam area, which is still ongoing, makes it premature to co-locate the Amsterdam emergency response rooms just yet. However, the management of the three emergency response rooms feels the necessity of closer cooperation. Since 2007 the emergency response rooms have been visited regularly by researchers (the authors of this paper included) and advisors looking into the questions of how they are organized, and governed, and communicate and cooperate.

To map the way cooperation works in practice – focusing on communication and information management - we have conducted a series of interviews in each emergency response room. At the time we participated in the project 'Improving the Multidisciplinary Information management', we looked into the various systems in use in the separate emergency response rooms, and into the way operators exchange information between emergency response rooms. It soon became clear that the emergency response systems were unconnected, and that most information was exchanged through telephone. Doing so sometimes makes it very difficult for operators to come to a shared understanding of what exactly is going on during an incident. It can even happen that not all emergency response rooms are aware an incident is taking place. Especially during 'GRIP' situations the exchange of information between emergency response rooms is insufficiently guaranteed.

Previous research in the emergency response room of the safety region Hollands Midden – which is located in the medium-sized city of Leiden, about 30 km south of Amsterdam, has taught us just how complicated such implementation is (Wagenaar, Boersma, Groenewegen and Niemantsverdriet 2008). Besides, the three Amsterdam emergency response rooms operate in a very demanding area because of the population density, and therefore the operators/centralists work under constant pressure. A co-located emergency response room in the Amsterdam situation could also create a too large and too turbulent environment. Yet clearer agreements on communication between emergency response rooms are definitely required. Enabling operators to look into other emergency response rooms' information systems could prevent a few of the most elementary mistakes. The question than emerges whether it is possible to learn to better understand each other without co-location.

6. Discussion: the Organization of the Emergency Response Rooms in Amsterdam

A Multi-layered Analysis (in progress):

6.1. With regard to the organization of emergency response rooms:
In a way, the Amsterdam situation mirrors Weick's concept of 'loosely coupled system's (Weick 1976; Orton and Weick 1990). That means that the urban safety

organization is partly based upon an integration of three separate emergency response rooms with a minimum of assumptions about each other, each other's work and routines. The operators at the response rooms work (quasi) autonomous and are only weakly interdependent. The question is: is it always a disadvantage for systems to be loosely coupled!? We would like to take a contingent view with regard to the value of loose coupling of emergency response rooms. Loose coupling is a dialectical concept that '…emphasizes complex patterns of simultaneous coupling and decoupling.' (Orton 2008; cit p.834).

6.2. With regard to the systems in use:

The use of ICT has led to a degree of virtualization (Woolgar 2002) of the urban safety work. Although the lack of integrated systems is a problem when it comes about smooth communication between the three emergency response rooms, it is not so much the technology, as it is the institutional and organizational arrangements that are the bottlenecks when it comes to the emergency response room in-action.

7. Conclusion

In this article we presented an overview of the way safety-issues are governed, managed and organized in one region in the Netherlands. As we have shown, the implementation of the safety regions meant a major re-organization of the ERRs. Most of the rooms in the Netherlands are now co-located – Amsterdam is only virtually co-located – which means that the three disciplines red (the fire brigades), white (the medical services) and blue (the police) are put together into one room. Next to the introduction of the safety regions and the major re-organization of the ERRs new ICTs have been introduced.

In this article we have shown that these three organizational developments – the establishment of safety regions, the co-location of emergency response rooms and the implementation of new ICTs - had a major impact on the way the rooms operate. What research in the Amsterdam-Amstelland safety region clearly shows is that it is not so much the different work-processes and routines that make cooperation difficult, but insufficient information management and complex organizational configurations.

We can say that, although the ERRs do function well as stand-alone organizations, the emergency response organization as a whole in Amsterdam has

problems to fulfill its most important task: to coordinate the communication between the safety services at the time of a major incident. In our contribution we made clear that the communication between the emergency rooms of the red, white and blue safety organizations is not well organized. Shared information systems such as C2000 and GMS and the planned implementation of netcentric work – which we presented in this article - might prevent situations of misunderstanding and miscommunication, but are to be seen as promising and demanding technologies.

Yet, the idea that a shared and uniform information system for all three ERRs could be implemented on short notice is slightly naïve. Moreover, it is not so much the emergent management technology that will bring resilience into the system. At the most ICT can *support* the response personnel in their task. The emergency response system should be designed in such a way that it can anticipate upon contingencies at the time of an incident. In order to accomplish that, the organization of emergency response should be treated not as a technical but as a social-organizational phenomenon in the first place.

Although the lack of integrated systems is a problem when it comes to smooth communication between the three emergency response rooms in Amsterdam, it is not so much the technology, as it is the institutional and organizational arrangements that are the bottlenecks when it comes to the ERR in-action. That means also that if the new paradigm of netcentric work (green) will be introduced to create a 'shared picture at the time of an incident' without taking the contingencies of major incidents into account, it will not likely bring a solution to the information-sharing problem.

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