

Emergency Response Rooms in Action: an ethnographic case-study in 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, ICT systems in-use, ethnographic case-study

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 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 and how these actors make use of the information systems. We will present a 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.

RESEARCH AGENDA AND METHODS

This article is the result of a literature review and an in-dept empirical (ethnographic) study (including site-visits, interviews and observations) on emergency response rooms in the city of Amsterdam. We followed Weick's concept of sensemaking, useful continued contact, and information gathering from individuals in safety organizations such as the emergency response rooms, which enables insights in how they actually accomplish their tasks and how they make sense of the organizational configuration they work in. 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.' In reconstructing local sensemaking activities, we mainly used four different but related sources.

First of all, we interviewed key-persons at the three emergency response rooms in Amsterdam 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 management issues, the work-routines of the operators and the communication 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.

Secondly, we participated in the practitioners' project *Improving the Multidisciplinary Information management* in December 2007 and January - June 2008 headed by the Amsterdam fire department. 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.

In the third place, we participated in the practitioners workshop *Multidisciplinary Workgroup on Information Mangement Amsterdam-Amstelland* in which the latest developments concerning ICT implementation in the Amsterdam emergency response rooms have been discussed. This part of our research can best be described as *action research* (Reason & Bradbury, 2001), which brings together action and reflection and theory and practice in a specific context of application and in cooperation with practitioners.

In the fourth place, and finally, we analysed additional, written material in order to gain a better understanding of the broader context in which the emergency response rooms are situated. The documents reviewed – a list can be provided by the authors - 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 themselves and from their websites. Documents written about the organization were also reviewed, including newspaper articles and other media-related information, which provided important input for the reconstruction of the position of the emergency response rooms in the Dutch safety policy.

In this paper we present the main findings of our ethnographic approach without (given the size of the paper) elaborating in full detail on the actors' day-to-day practices. The advantage of Weick's approach, however, is that we are able to present the life-worlds of those who work in the ERRs rather than taking their sensemaking activities for granted. The sensemaking approach, moreover, gives room for the presentation of local dilemma's of the actors that otherwise remain unnoticed. Finally, is carried out in such a way that it can improve our theoretical understanding of the ERRs in action (Eisenhardt, 1989).

SAFETY POLICY in the NETHERLANDS

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). Before, national traumas, such as the airplane crash in the Amsterdam suburb the Bijlmermeer in 1992, the explosion in the firework factory in May 2000 in the town of Enschede, and the fire in a Volendam café at New Years Eve 2001 put 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 had failed at the time of the incident and that the back-offices of the organizations did not meet expectations (Commissie Onderzoek Vuurwerkkramp [Investigation Committee Fireworks-incident] 2001). It was especially the communication in and between the ERRs – the committee uses the term 'nerve centers' for these organizations – that failed at the time of the incident.

EMERGENCY RESPONSE ROOMS IN ACTION

Against the background of international and global threats and discussions about safety, the Dutch government has undertaken several measures to (re)organize safety. The most sticking one was the introduction of 25 safety regions (see Figure 1).

In addition, steps have been taken to (physically) house the three disciplines' (fire brigades, the medical services and the police) ERRs' personnel at one site. Such a new ERR, which houses the three disciplines, is known as a 'co-location' or a 'co-located' ERR. We can discern three degrees of co-location: an integrated co-location (an operator working in this room can take any call. An integrated co-location also implies an integration of the room's ICT content systems); a multi-disciplinary co-location (operators of the three disciplines are housed together, but operators only take discipline-specific calls); a virtual co-location (the operators are not necessarily housed in one room, but can have face-to-face contact with each other by means of ICT).



Figure 1: the Dutch Safety regions. The white oval points out the safety-region *Amsterdam-Amstelland* and is our addition to the figure (source: <http://www.rampenhulpverlening.nl/vbd/vbdveiligheidsregios.html>).

Parallel to this initiative, new ICT systems have been introduced to facilitate the communication in and between the operators/centralists in the rooms and between the operators and the personnel in the field. As could be predicted, the (technical) integration of emergency response systems in the Netherlands was not an unproblematic matter (Groenewegen & Wagenaar, 2006; Wagenaar et al., 2009). No ICT system will exactly follow the intentions of its producers. Instead, how an ICT is actually used (and what an ICT actually is) is contingent upon the users' actions and choices (Orlikowski, 2000).

In other words, in itself the ERRs ICT systems are nothing than only promising devices (Van Lente, 1993) and in the process of implementation ICT turn out to be highly demanding (Boersma and Kingma, 2005).



Figure 2. The Medical ERR in Amsterdam (source: <http://www.acutehulp.gezond.amsterdam.nl/>).

At least two aspects are important to understand how ERRs actually work and how ICTs are used:

The different backgrounds of the three disciplines

It is important to realize that the integration of ERRs implied a merger or a close cooperation (which is, as we will see the case in Amsterdam) of three different organizations and organizational routines. A study on the integration of ERRs in Florida, USA, indicates that it is important to consider the cultural dimension of the organizations and the identities of the people involved (Stinchcomb & Ordaz, 2007).

For the fire brigades (red), to begin with, the ERR 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 ERR literally told us: ‘...if an incident becomes interdisciplinary, it immediately becomes a fire brigade show...’. For the operators in the ERR 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 to other parties when the officer in the field decides that the incident is so big that ‘upscaling’ is necessary.

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 112 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 ERR, 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 police, 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). 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.

Up scaling for all three disciplines means the increased involvement of other municipalities, disciplines or safety-regions. In case of up scaling the *Regional Incident Procedures* (the Dutch abbreviation is ‘GRIP’) is the leading protocol. A higher GRIP level is associated with increased needs to involve not only first responders but also operational and decision making teams. Above GRIP 1, which calls for interdisciplinary coordination civil authorities begin to take over the operations in a command and control situation. Therefore with increasing the involvement of other groups, interdisciplinary cooperation and communication and coordination requirements increase.

The implementation of ICTs in the rooms

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.

EMERGENCY RESPONSE ROOMS IN AMSTERDAM

Amsterdam is the most important city in the safety-region Amsterdam-Amstelland. 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 a physical co-location in Amsterdam is still ongoing and not an unproblematic issue. In the public report on ‘Physical Safety’ (2004) of the municipality of Amsterdam it is stated:

'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).

Recently, the Amsterdam ERRs have been virtually co-located, which means that an ICT-system (including a webcam) is used to enable the operators to have face-to-face contact at the time of an incident. This ICT system, however, is not connected to the content system (GMS) of the ERRs.

The most important question in the current debate in the safety governance in Amsterdam is whether the 'co-located' ERRs really should play a role in integrating the disciplines (and their GMS), as the personnel present mainly does the coordination on the site of an incident. The coordination of safety response involves the three disciplines and adequate communication between the disciplines is pivotal to the quality of the cooperation.

The three disciplines each have their own ERR at different spots in the Amsterdam city. Although there is a virtual co-location, the content information systems of these separate ERRs are not electronically connected. The ICT systems even differ between ERRs. The 'white' ERR works with a system called 'MIOS' (which is different from the standard system GMS), which it has developed itself. The other two ERRs work with the standard system GMS. In the daily practice of the emergency response organization this means that the information (as laid down in the systems) is not shared real-time among the different rooms, which can lead to simple miscommunications (for example about the exact location) at the time of an incident. The uncoupling of systems is thus a huge disadvantage.

Not co-locating the Amsterdam ERRs 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 ERRs just yet. However, the management of the three ERRs feels the necessity of closer cooperation. Since 2007 the ERRs have been visited regularly by researchers (the authors of this article included) and advisors looking into the questions of how they are organized, and governed, and communicate and cooperate.

At the time we participated in the practitioners' project *Improving the Multidisciplinary Information management*, we looked into the various ICT systems in use in the separate ERRs, and into the way operators exchange information between ERRs. 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 ERRs are aware an incident is taking place. Especially during 'GRIP' situations the exchange of information between ERRs is insufficiently guaranteed.

The Amsterdam practitioners' project *Improving the Multidisciplinary Information management* also made clear that remote and just-in-time information and expertise is crucial for an adequate emergency response. Yet, the project also made clear that it is not necessary that all the information possible at the time of an incident should be available for everyone in the field. For example local response personnel should not be constrained by formal information structures that will prevent them for improvisation and for being creative. Mendonça et al. in an article on Mix-and-Match technologies in emergency management put it even more bluntly: 'Shared situational awareness of a common operating picture is not a necessary precondition for enabling and supporting the distributed decisions and behaviors necessary for successful reaction to and management of the unexpected. The technological systems we design and build must enhance – not impede – organizational agility' (Mendonça et al, 2007: 49).

The latest development in Amsterdam is to hook up with the netcentric paradigm. It is still, however, unclear to the practitioners what exactly netcentric work means (which is, in fact, a matter of sensemaking) and how (if at all) it can be a solution to communication and coordination problems.

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.

REFERENCES

1. Boersma, F.K. and S.F. Kingma (2005). From Means to Ends: The Transformation of ERP in a Manufacturing Company, *Journal of Strategic Information Systems*, 14, 197-219.
2. Commissie Onderzoek Vuurwerkkramp (Investigation Committee Fireworks-incident) (2001). *De Vuurwerkkramp eindrapport*. Den Haag/Enschede.
3. Cooper, M. (2000). Safety Management in the Emergency Response Services, *Risk Management: An International Journal*, 2, 39-49.
4. Directie Openbare Orde en Veiligheid Gemeente Amsterdam (2004). Fysieke Veiligheid (Physical Safety). Amsterdam: Stadsdrukkerij Amsterdam N.V.
5. Eisenhardt, K.M. (1989). Building Theories from Case Study Research”, *Academy of Management Review*, 14(4), 532-550.
6. Groenewegen, P. and P. Wagenaar (2006). Managing emergent information systems: Towards understanding how public information systems come into being, *Information Polity*, 11, 135-148.
7. Helsloot, I. (2007). *Voorbij de symboliek. Over de noodzaak van een rationeel perspectief op fysiek veiligheidsbeleid*. Den Haag: Boom Juridische uitgevers.
8. McConnell, A. and L. Drennan (2006). Mission Impossible? Planning and Preparing for Crisis. *Journal of Contingencies and Crisis Management*, 14(2), 59-70.
9. Mendonça, D., T. Jefferson and J. Harrald (2007). Collaborative adhocacies and Mix-and Match Technologies in Emergency Management, *Communications of the ACM*, 50(3), 45-49.
10. Orlikowski, W. J. (2000). Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. *Organization Science* 11(4), 404-428.

11. Perry, R. W. (2003). Emergency Operations Centres in an Era of Terrorism: Policy and Management Functions. *Journal of Contingencies and Crisis Management*, 11(4), 151-159.
12. Perry, R. W. (2004). Disaster Exercise Outcomes for Professional Emergency Personnel and Citizen Volunteers. *Journal of Contingencies and Crisis Management*, 12(2), 64-75.
13. Reason, P.W. and H. Bradbury (2001). *Handbook of Action Research: Participative Inquiry and Practice*. London: Sage.
14. Snellen, I.Th.M. (2000). Territorializing governance and the state: Policy dimensions of Geographic Information Systems, *Information Infrastructure and Policy*, 6, 131-138.
15. Stinchcomb, J.B. and F. Ordaz (2007). The Integration of Two “Brotherhoods” into One Organizational Culture: A Psycho-social Perspective on Merging Police and Fire brigades, *Public Organiz Rev*, 7, 143-161.
16. Van Lente (1993). *Promising Technology. The Dynamics of Expectations in Technological Developments*. Delft: Eburon.
17. Von Lubitz, D.K.J.E., J.E. Beakley, F. Patricelli (2008). Disaster Management: The Structure, Function, and Significance of Network-Centric Operations, *Journal of Homeland Security and Emergency Management*, 5(2), article 42,1-24.
18. Wagenaar, P., F.K. Boersma, P. Groenewegen and P. Niemantsverdriet (2009). ‘Coping with ‘co-location’ Implementing C2000 and GMS in the Dutch police region ‘Hollands-Midden’, in: Meijer, A., F.K. Boersma and P. Wagenaar, *ICTs, Citizens & Governance: After the Hype!* IOS Press, Amsterdam, 119-134.
19. Weick, K.E. (1995). *Sensemaking in Organizations*. London: Sage.