INFORMATIK 2011 - Informatik schafft Communities
41. Jahrestagung der Gesellschaft für Informatik , 4.-7.10.2011, Berlin

www.informatik2011.de

Framework conditions and fields of application of an IT-Rescue Management Support System (IT-RMSS) for authorities and organizations with safety responsibilities (BOS)[1] in mass casualty incident (MCI)

Wucholt, F., Mähler, M., Krannig, Y.

Fachgebiet Interkulturelle Wirtschaftskommunikation
Friedrich-Schiller-Universität Jena
Ernst-Abbe-Platz 8
07743 Jena
fabian.wucholt@uni-jena.de
mareike.maehler@uni-jena.de

Abstract: In order to develop an IT-based RMSS, several determinants should be taken into consideration. In regards to operative forces, certain framework conditions need to be considered, especially when dealing with large-scale damage events to ensure acceptance and effective usage of additional devices. These framework conditions, determined by psychological and legal factors, are closely linked to specific fields of application. This paper presents an overview of relevant problem areas, resultant areas of application and functionalities of an IT support system.

1 Introduction

Scenarios of the past years has made clear that the technical support of rescue workers and police are becoming increasingly important to research and industry on the domestic and international level. As the development of heavy technical equipment which process MCI gains significance so does the response of IT-technologies – especially concerning the organization and management of complex situations. The joint project "SpeedUp"[2] (BMBF[3]) deals with application possibilities and the development of such technologies. Emphasis is placed on the improvement of inter-organizational cooperation of different BOS in case of a MCI and to support operative forces beyond their routine work. One of SpeedUp's goals is the development of an IT-sustained "rescue management support system" (IT-RMSS). Therefore, improving the concrete support of forces of the different BOS dealing with large-scale damage events and mass casualty incidents[4] (MCI) and

---

[1] German equivalent: Behörden und Organisationen mit Sicherheitsaufgaben (BOS).
[2] www.speedup-projekt.de
[3] Bundesministerium für Bildung und Forschung: Federal Ministry of Education and Research.
[4] The concept of large-scale damage events and mass casualty incidents will be dealt with in section 2.

facilitating intra-organizational and inter-organizational communication. In addition to focusing on points of acceptance and evaluation, the following research concerns general issues within the fields of IT-RMSS application and the derivative functions for technological development on mobile devices for technical partners. In this paper the results of our research will be presented.[5] For our purposes, the field of application will be described according to general characteristics of a MCI as well as any theoretical considerations relating to the research area of complex problems. According to this, fundamental theories and research-based possibilities of support of an IT-RMSS will be discussed. This discussion will be supplemented with qualitative results gathered from observations and expert interviews with operators. Afterwards, the roles and tasks of an RMSS will be explained for each stage of a MCI. Finally, this paper focuses on the user-specific requirements that an IT-RMSS should fulfil. Possible functions of a support system for full-time BOS involved in a MCI (in our case: police, emergency medical services, and fire brigades) will be determined. Although BOS are not the only active organizations in a MCI, their everyday working life is characterized by close cooperation and averting danger.

2 MCI as a complex problem

Generally, the concept "MCI" is not used for national or cross-organizational boundaries. However, it is clear that responsible organizations of one region[6] might reach their performance capacity, due to a staff shortage, when dealing with a large-scale damage event. When alerting, inconsistent definitions of terms may lead to different characterizations of emergencies across organizational boundaries. In Germany, DIN-Norm 13050 (concepts of emergency medical services) [DIN02] defines a MCI as an emergency with a high number of casualties or ill, including other damages or persons concerned that can be provided with the available and related rescue service provisions of the respective area.[7] This first classification only applies when the number of effected people does not exceed 50 (MCI stage 1). MCI stage 2 (50 − 500 casualties) cannot be dealt with by the regular rescue service[8] and requires trans-regional help. In this paper, we use the term MCI synonymously with a situation that the responsible organization cannot handle with its own work force. Furthermore, the term MCI needs to be distinguished from the word "catastrophe". It must be mentioned that across organizational borders the term MCI is not (always) familiar to the police. The police

---

[5] Our findings apply to the BOS-structures in Germany. Hence, they cannot directly be assigned to authorities and organizations with safety responsibilities in other countries.
[6] This especially applies to organizations of FLÄCHENLÄNDER
[7] "einen Notfall mit einer größeren Anzahl von Verletzten oder erkrankten sowie anderen Geschädigten oder Betroffenen, der mit der vorhandenen und einsetzbaren Vorhaltung des Rettungsdienstes aus dem Rettungsdienstbereich versorgt werden kann." (Nr.3.21 ff.)
[8] German equivalent: Regelrettungsdienst.

INFORMATIK 2011 - Informatik schafft Communities
41. Jahrestagung der Gesellschaft für Informatik , 4.-7.10.2011, Berlin

www.informatik2011.de

use the term "major danger- and damage events and catastrophes"[9]. However, in this paper the term MCI is not equivalent to a "major danger and damage event" [B11]. So, what does a MCI mean to the involved forces? For task forces it constitutes a complex, dynamic and emotional (operation) situation in which they are exposed to stress factors and need to manage and coordinate different tasks. Due to its rarity it constitutes an unknown situation to task forces, which exists beyond their routine work life. Despite the various MCI classifications and definitions of the respective organizations, the fundamental characteristics of rescue operations are disproportionately site-specific work tasks to the number of action forces. In addition, although the event is massive, it is spatially isolated. Despite its supposed uniqueness and situation-specific aspects, every situation shows similar problem characteristics to some degree [C05]. Compared to the natural and differentiation of operation-specific specialities (cold situation[10]), the concrete MCI (hot situation[11]) shows all the features of a complex problem with varying degrees of complexity. Dörner [D79] characterizes a complex problem with the following attributes:

- *Cross-linked* (there are numerous variables that show cross connections, e.g. decisions and actions of individual leaders of the BOS)
- *Dynamics* (time changes that lead to a deviation of the original problem definition, e.g. the change of the on-site situation: the number of casualties to be evacuated differs throughout the operation)
- *Lack of transparency* (not all the information, e.g. needed by a leader, is available).
- *Polytely*[12] (the necessity to optimize more than one criteria of the operation, e.g. disposition of forces and resources to certain positions of the site; the different original tasks of the BOS)

What additional aspects characterize a MCI as a complex problem? Lasogga and von Ameln [LA10] point out that certain issues appear only when the BOS cooperate in order to work on the complex problem:

- Lack of compliance with defined structures and processes due to personnel reasons (e.g. shortage of forces)
- Lack of compliance with defined structures due to cultural reasons (implicit rules control the activities of actors, incompatibility of BOS is possible)

---

[9] „Größere Gefahren- und Schadenslagen und Katastrophen".

[10] Cold situation describes the general situation of an operation including topographic features, cultivation, and weather.

[11] The hot situation describes the dynamic process of a site during an operation including dangers for human beings and the environment as well as information on how the situation is developing (e.g. the spreading of fire).

[12] from Greek roots meaning 'many goals'

- Lack of consideration with the need of information of various actors ("Who needs what data?")
- Lack of feedback (in response to how the recipient received the information)
- Inadequate distribution of tasks or vague distribution of tasks

Beyond these theoretical aspects, further problem specific areas of a MCI can be identified based on inquiries (expert interviews with representatives of BOS, observation of exercises)[13]:

- Vague state of information on "what happened" at the time of the alert and at the stage of approach
- Complicated consultations at the site on account of missing executives or their unknown whereabouts
- Indistinct communication (different terms for the same circumstance; problems in communication due to technology – e.g. failure of radio)
- Vague or insufficient marking of action forces and resources
- Tasks, competencies, and responsibilities of the other organizations are unknown ("Who is leading?")
- No shared model of information regarding the overall situation (e.g. due to the fact that actions are double initiated)
- Commitment towards the original task of the organization – competing prioritization of tasks (example: averting of a danger prior to criminal prosecution)
- Ineffective coordination/ disposition of tasks and resources
- Obscurity of number and whereabouts of forces and resources (own and "external")
- Friction loss based on uncoordinated actions of actors
- Overload of information (too much information appears at the same time and has to be processed simultaneously)
- Suboptimal division of space (access roads, stopping places)

An IT-RMSS could support the activities of on-site action forces according to the aspects listed above. In the following section, a MCI will be described more precisely and answer the questions: What framework conditions characterize a complex problem? What psychological factors are task forces exposed to when working on a MCI?

---

[13] The following aspects represent a selection of the data collected in the inquiries.

2.1 Framework conditions of a MCI

Central to the rudiments of a MCI is the question, if the overall situation represents a non-police operation[14] or if it is a part of a police-integrated operation[15]. For instance, hostage-takings and killing sprees are counted among police-integrated sites. However, the majority of operations in Germany represent situations of emergency management authorities ("fire brigade site[16]"). This implies that a fire brigade is in charge of the leadership of all operations and also needs to provide the overall-leader of the operation. Thus, in this paper the framework conditions of a MCI and possibilities for potential support with an IT-RMSS focus on the non-police-integrated part of an operation. What concrete framework conditions dominate a MCI? The complexity of such a situation easily leads to extremely diverse framework conditions. This implies that internal conditions such as resources, transport, and other aspects of the physical, political, social, and economical environment may highly limit the availability and effectiveness of emergency aid, as well as external conditions, such as time of operation (day/night, weekday/ weekend), weather (temperature, precipitations, wind, lighting conditions and visibility) or aspects that endanger the forces' lives (protective suits). Furthermore, the location (urban, country) and the transportation infrastructure (different types of road, tracks, air etc.) levy emergency measures. The duration of an operation is determined by the damage of a situation and also includes food preparation for the staff, the relieving of personnel, the concomitant passing on of important information (actual state[17]), and is also influenced by consequential and simultaneous measures. Thus, the number of action forces that are already on duty or that could be alerted heavily depends on the time of day and day of the week. It becomes obvious that a MCI represents a dynamic situation and consists of an infinite number of variables. Many parameters of an operation change in the process of the execution (action forces are deducted because of a parallel running operation, the weather changes, etc.) and are extremely hard to plan in advance. Moreover, the exact time of a parameter change cannot be anticipated. Each MCI is distinct. A MCI on a motorway constitutes a completely different situation due to its specific features (access route, tailback, possible consequential accidents) than a MCI after an explosion in the city centre. Also, the possibility for divergent goals of the involved organizations heeds consideration. For instance, from a police perspective, prosecution takes precedence over averting danger (which is a part of the responsibility field of the fire brigade and medical service, but also of the police). On one hand a severe amount of information has to be processed by action forces; on the other hand, this amount of information needs to be documented by the forces as well. The inquiry of information is highly sensitive with regard to the legal boundaries (e.g. the medical

---

[14] Also known as Emergency Management Authority (German: nicht-polizeiliche Gefahrenabwehr).
[15] German equivalent: polizeiliche Gefahrenabwehr.
[16] German equivalent: „Feuerwehrlage".
[17] German equivalent: Ist-Zustand

services must respect confidentiality, yet provide information for clinical casualty estimates). When documenting such sensitive data electronically as supposed to paper-based protocols, a variety of privacy regulations and data protection laws need to be followed. Hence, operation-specific framework conditions of a MCI can never fully be outlined and technically displayed in advance. Therefore appropriate flexibility in the functionalities of an IT-RMSS is essential for its actual use. Now that a MCI has been introduced as a complex problem and its framework conditions have been described, the psychological factors of such an operation will be illustrated to clarify the circumstances under which the usage of technical devices takes place.

2.2 Psychological Factors

Besides the organizational, operation-tactical, and privacy protection concerning framework conditions, psychological aspects of a MCI also need to be taken into account. Action forces act in an indefinite ad-hoc structure, which differs from everyday life and are susceptible to the following psychological processes [GK08]:

- State of a shock due to the events
- Fear of failure
- Fear of responsibility
- Noise and agitation at the site
- Physical needs (hunger, thirst, lack of relaxation)
- Stimulus satiation due to an enormous amount of information (see below)
- Disorientation because of missing or contradictory information
- Emotional involvement
- Pressure of making decisions and acting without having assured data

Under certain conditions forces are exposed high psychological risk and are even traumatized from duty. At the same time, the number of misjudgements and technological errors may increase with higher amounts of stress and might even hinder operation processes. Keeping this extreme pressure and consequences in mind, forces tend to suffer from distortion of perception, in which partial or total loss of psychological functions (such as the perception of the environment) may result. Therefore, forces can only rely on their cognitive abilities to a certain extent. More complex operations carry a higher risk for mistakes. This implies a considerable restriction of quality regarding the overall handling of an operation [A08; KMC05]. Schaub [S06] describes four causes of failures: The narrowness of cognitive resources leads to a reduction of available information. This reduced information processing leads to an overvaluation of the current motif. For instance an organizational medical leader[18]

---

[18] German equivalent: Organisatorischer Leiter (OrgL).

INFORMATIK 2011 - Informatik schafft Communities
41. Jahrestagung der Gesellschaft für Informatik , 4.-7.10.2011, Berlin

www.informatik2011.de

(OrgL) of the medical service has to cope with several tasks at the same time (organizing the construction of treatment units, demanding further forces, implementing the instructions of his leading medical doctor [19] (LNA)). Because of his restricted cognitive abilities the OrgL might only focus on information concerning the construction of treatment units (current motif) and therefore fade out or forget about other information (regarding demanding further forces) and might forget to process these respectively. Another cause for failure that Schaub [S06] mentions is the protection of the awareness of own competencies[20] ("What task is especially beneficial for me when implemented quickly?"). Due to the listed causes the following symptoms can apply to action forces [GK08]:

- Acting instead of thinking and planning
- Preferring faster and easier solutions
- Avoiding critical views on the own patterns of thinking
- Fading out information that is contradictory to the own view
- Physical symptoms (shaking, sweating, lack of concentration)

After the framework conditions of a MCI and the psychological factors of such a situation have been presented there are several fields of application of an IT-RMSS that can be outlined.

3 Ways of supporting an operation with an IT-RMSS

The following presentations of possible ways of optimizing and supporting the management of a MCI include both the results of the inquiries regarding the information needs as well as user-specific requirements of an IT-RMSS. How can an electronically system support the action forces when working on a MCI? How can an IT-RMSS solve the MCI problems listed above? It should again be mentioned that a MCI is an ad-hoc situation and therefore usually does not allow the installation of an infrastructure based on information technology in the first place. The lack of information about casualties and available resources complicates the making of well-founded decisions for leaders during a MCI. To solve this problem the information flow to and from the operation site needs to be increased considerably without blocking the overall operation leaders due to an information overload. Radiotelephony is well suited for giving directions or for the coordination of rescue workers. However, the information range is highly restricted and the receptive capacity of the operation leaders limited. Therefore it is essential to relieve radiotelephony and at the same time increase the overall amount of available information. Broadly speaking an IT-RMSS is supposed to support action forces in

---

[19] Leitender Notarzt (LNA).
[20] German equivalent: Schutz des eigenen Kompetenzempfindens.

saving human lives. With the help of electronic support a MCI can be faster, more efficient, and characterized by less friction loss (double initiated measures, lost information, etc). Comprehensive, complexity-reducing tasks of an IT-RMSS can be summarized as follows:

- Improvement of the shared mental model (better coherent indirect decision-making and initiation of measures) of all three BOS
- Enabling of task-specific, inter-organizational shared use of knowledge (improvement of "situation awareness") of the executives
- Presentation of the "actual" overall situation
- Increase of situational ability to act concerning all forces (e.g. with the help of electronically supported application of checklists and SOPs[21])
- Support of communication
- Support of the distribution and operation of resources
- Better management of the variety of measures, e.g. by the use of prioritization
- Reduction of insufficient transparency with regard to the overall site
- Improvement of the inter-organizational cooperation of BOS due to an easier exchange of information

To ensure an actual technologically support of the action forces, it is necessary to create a tool that is available at all times, that is suitable for the different types of people involved when working on a MCI, and supplement their needs of communication and information. This approach is based on the notion that usage of technical tools requires routine and is asserted by different functions of the IT-RMSS that can be found among regular operations (e.g. GPS-routing, administration of master data, communication). The goal of the support system is to (preferably) simultaneously communicate the overall on-site situation (people involved, resources, running processes) without obstructing the actual operational processes.

3.1 Special requirements of action forces for an IT-RMSS in action

In addition to the more abstract possibilities of assisting a support system mentioned above, the following basic user requirements for an IT-RMSS could be extracted from the expert interviews with representatives of BOS. Above all, the BOS is in need of gathering information that has been collected by on-site action forces. Information about the entire development of the operation should be available to all BOS if legally defensible. Furthermore, every BOS has an interest in knowing the number of casualties and deaths as well as knowing how many casualties have been taken to which hospital. With the help of an IT-RMSS it should be possible to receive an assessment of the on-

---

[21] Standard Operating Procedures.

site situation in real-time. Thereby, it is important to note the different terms that are used by the BOS in their everyday work life and responding to a MCI. Moreover, an IT-RMSS should enable access to information about hazardous substances and endangered areas. It should also be usable without any other media (e.g. a clipboard with paper). However, the fact that decisions cannot and must not be made for the operation forces need to be considered. If wanted, aid is available through checklists ("What do I do in the case of...?"), and should assuage action forces in an event that is not as common as a MCI. Patient tracking at the scene of an accident should also be possible. The user interface (UI) of an IT-RMSS should be designed in a user-friendly way and needs to consider and satisfy the needs of different functions (OrgL, LNA, ELO[22]). Overall, the inter-organizational cooperation should be improved with the help of an electronic connection regarding structures of the BOS involved in a MCI. Therefore the different functional needs of the individual BOS need to be taken into account. The responsible forces constantly collect information. Uneven data collection results since different circumstances entails different decision-making, for example an assessment of the on-site situation versus the organization and delegation of tasks. These differences need to be considered, e.g. when designing an UI. The different prioritizing of the information needs can be categorized as follows:

- Regional planning and information concerning the site/ infrastructure of the area
- Position of operation leaders and action forces as well as operation resources
- Information about hazardous substances and endangerments
- Data about persons affected

To fulfil the aforementioned general and user-specific requirements an IT-RMSS should meet certain functionalities. In the following section, these functionalities are demonstrated at each stage of a MCI (starting with the alerting and leading to the dismantling).

4 The role of an IT-RMSS in the different phases of a MCI

Previous analyses showed that operation forces have different information and communication needs during a MCI according to their current phase. Furthermore, these needs differ depending on the level of hierarchy and mission as well as the function of the action force during the operation. Since the aim of this paper is to present basic application areas of an IT-RMSS, the missions of the MCI are generically assigned. Obviously in a real operation the transition from one stage to another is flowing. The stages are not processed successively across organizational boundaries but according to the urgency of their missions and parallel to different levels of hierarchy. For a better

---

[22] ELO: squad leader of the forces (police) on-site, German terminology: Einsatzleiter Ort

overview with regard to the arrangement and procedure of a MCI, individual procedures have been structured into stages. To ensure a manageable representation of the functions there is no simulated separation of stages.

4.1 The IT-RMSS in the phase of alerting/ approach

The goal should be to provide the operation forces with the latest information on the cold situation and hot situation as well as their own situation when they are approaching the site.[23] The control centers of the BOS receive the first information concerning the site and these will be available to the action forces that have been alerted first (via radio). Therefore, the connection of gathered feedback at the control center (information regarding the situation[24]), database information about the operation site, maps and position data (drives, collection point for personnel), as well as cognitive support in order to prepare the operation according to the alerting (e.g. checklists, SOPs, regulations concerning procedures) would be possible and could be ensured by an interface of an IT-RMSS with the used control center systems. The significance of integrating control centers into a support system does not only result from the fact that they provide important information but also due to their duty of ensuring regular service besides the MCI. The control centers are a part of a MCI-scenario and responsible for the distribution of vehicles. Despite this having a control center, the IT-RMSS should function independently and provide backup levels in case of a headquarter failure.

4.2 The IT-RMSS in the chaos phase/ early phase

In the early stage of a large-scale operation only regular everyday-working resources are provided because they are immediately accessible and ready for use. This stage is deemed to be the most critical phase of all for the use of electronic support since the psychological pressure is extremely high for the action forces and additional devices are seen as an extra burden. The stage is characterized by extreme emotional stress for the operation forces, high dynamics, and a variety of tasks, goals, as well as an enormous amount of information. Characteristics includes the lack of an organizational structure, a leadership and communication structure, the constant arrival of additional operation forces, and a number of provisionally staffed leadership roles. The designated tasks that are sometimes difficult to understand, trouble with regional planning, difficulties outlining the overall situation, as well as differing triage outcomes have been identified as neuralgic problems during the interviews. It clearly shows that in this stage especially the input of information by the operational forces is problematic. In particular an IT-RMSS has to be characterized by control elements that are easy to handle to ensure

---

[23] Own situation describes existing resources such as available personnel and the available technology.
[24] Lageinformation.

usage and acceptance throughout the action forces. It is very important to utilize resources effectively in this stage to avoid double-checks.

4.3 The IT-RMSS in the development phase

The development stage or transition phase is also marked by high dynamics because the existing staff and material are constantly supplemented by an influx of additional units. With many casualties, the first duties concern the construction of on-site treatment units as well as the organization of transportation to other treatment centres. The so-called development stage implies the creation of structures in order to work on-site and operation forces as well as resources are brought to the site. This is why the IT-RMSS should fulfil the following functions (examples):

- Information-gathering instrument for personal data and situation data
- Presentation of the organization of the on-site situation/ regional planning
- Disposition instrument, e.g. assignment of operation forces and resources to the individual operational areas

In this stage the IT-RMSS could support the decision-making with the help of several functions and furthermore network the BOS among themselves.

4.4 The IT-RMSS in the processing phase

During this main phase, the space in the treatment areas is ready to use and the patient transportation is ready for action or already in process. Moreover, the participating organizations develop their leadership and communication structures. An efficient layout of the treatment space is necessary to identify patients on site and to use initially limited resources of treatment and transport according to their priority during a MCI. Depending on the severity code of their injuries, patients are categorized into different classifications, which indicate the time allotment and severity of their injuries. At the same time, registration and marking of patients takes place. Then, transport escort patients from satellite treatment places to further medical facilities. Once the necessary leadership structures have been created according to the site and the operation can be processed, the IT-RMSS should mainly support the work of the action forces in the following scenarios (examples):

- Leadership tool for executives/ leaders (documentation of the operation)
- Information source for external information (information about the infrastructure)
- Representation of organizational structures (of own and other BOS)

INFORMATIK 2011 - Informatik schafft Communities
41. Jahrestagung der Gesellschaft für Informatik , 4.-7.10.2011, Berlin

www.informatik2011.de

- Instrument for communication, e.g. for transmission of directions or exchange of information (inter-organizational)
- Instrument for representing the site (digital maps)
- Floor plan/ regional planning (e.g. with the help of a map)
- Administration of resources, e.g. instrument for distribution (example: assigning patients to life-saving appliances and hospitals)
- Instrument of localization (tracking of patients, resources, staff)

With the help of the IT-RMSS, the functions described should take a considerably lesser amount of time. Furthermore, an internet connection and the integration of information systems expedite access to prepared materials and additional information. Again, the IT-RMSS could support decision making with the help of intelligent programs and facilitate inter-BOS communication during this stage.

4.5 IT-RMSS in the decommissioning phase

In this stage responsible forces observe which operation vehicles have already left the site and which operational areas are about to start with decommission. The decommissioning stage is not one of the stages primarily addressed by the "SpeedUp" project; however, an IT-RMSS could support the process of this stage with previously collected information. The electronically gathered information (documentation of operation) allows reproduction of the operational events in order to implement the post-processing of the event (accounting). Not all the organizations follow the same sequence of stages. According to its mission a BOS might finish the operation and start decommissioning before other BOS do. This is why it is important to keep records of the overall operation structure (e.g. whereabouts of patients and staff) and to end the operation in an organized way. Therefore, all actions that have been done and still need to be done need to be documented. Support provided by an IT-RMSS should be based on complete documentation and representation of MCI operations.

5 Summary

From a technical point of view the framework conditions and application areas lead to many approaches for implementation. The goal of an IT-RMSS should not be the replacement of proven technologies and patterns of behaviour (such as radio or exchange of verbal information). However, the complexity of circumstances during an operation can be reduced in many areas and the action forces can be selectively supported throughout the different stages. Therefore, it should be possible to gather various organization-specific data regarding the site and make them accessible throughout the different organizations in compliance with legal regulations.

An IT-RMSS should support faster reproduction of on-site information management through various terminal equipments, shorter information access times, and the improvement of shared assessment of the situation for operation forces. Especially in the beginning of the operation, information concerning the current situation is collected from different positions, and can be brought together with the help of technological support, e.g. the technical operation management[25] (TEL). A technical support system should assist in gathering information and support their prompt transmission and storage by offering several possibilities of data processing and data entry. It requires a monitor and support system at various places in order to ensure forces to act according to their learned standard procedures. Therefore, even electronic checklists could be used. Throughout an operation there is a constant inflow and outflow of operation staff and resources. Hence, the staff and resource management is faced with the challenge of good coordination, structuring, and administration. An IT-RMSS needs to support the responsible force in organizing the supply and logistics, in addition to the exchange of operation forces. Therefore, overviews must provide information of available operation resources and forces as well as their current missions. It implies the role-specific representation, e.g. the administration of arriving and departing vehicles as well as additional claims. Thus the integration of control centers seems to be necessary. Also requested and approaching operation resources that have been assigned with a task (e.g. transportation) need to be registered. The loss of information due to change of personnel, "forgetting", or subjective reproduction of processes can be prevented by intelligent operation documentation with the IT-RMSS. Accordingly, the personnel management and resource management represent a challenge that requires good coordination, structuring, and administration. The user-interface of an IT-RMSS needs to be designed to be user-friendly, so that operation forces do not have extra burdens. Also, operation forces need to accept the IT-RMSS and should be involved in the development of the instrument at an early stage. The hardware needs to withstand the (extreme) conditions of an operation and the usability of the devices should be evaluated under the conditions of an operation.

---

[25] Technische Einsatzleitung (TEL)

INFORMATIK 2011 - Informatik schafft Communities
41. Jahrestagung der Gesellschaft für Informatik , 4.-7.10.2011, Berlin

www.informatik2011.de

Literaturverzeichnis

[A08]   Adler, T. (2008): Belastung und Prävention im Einsatzwesen – eine qualitative Erhebung mit GABEK. In: J. Zelger, M. Raich & P. Schober (Hrsg.), GABEK III, Organisation und ihre Wissensnetze (S. 195-209). Innsbruck, Wien, Bozen: Studien-Verlag.

[B11]   Bundesministerium für Begriffe, Erläuterungen, Definitionen. Online im Internet: Bevölkerungsschutz und Katastrophenhilfe (o.J.) URL:http://www.bbk.bund.de/nn_398012/DE/06__Fachinformationsstelle/09__Definitionen/Definitionen__node.html__nnn=true

[C05]   Cimolino, U. (2005): Standard-Einsatz-Regeln (SER). Online im Internet: URL: http://www.standardeinsatzregel.org.

[DIN02] Deutsches Institut für Normung e.V.(2002) DIN-Norm 13050. Begriffe im Rettungsdienst.

[D79]   Dörner, D. (1979): Kognitive Organisation menschlicher Informationsverarbeitung. In: Ueckert, H.; Rhenius, D. (Eds.): Komplexe menschliche Informationsverarbeitung. Bern: Huber.

[GK08] Gahlen, M., Kranaster, M. (2008): Krisenmanagement. Planung und Organisation von Krisenstäben, Stuttgart: Deutscher Gemeindeverlag.

[J10]   Jäger, B. (o.J.): Führungsstrukturen bei aufgabenübergreifenden Einsätzen von Feuerwehr, Rettungsdienst und Polizei (am Beispiel des Landes Hessen). Online im Internet: URL: http://www.polizei.hessen.de/internetzentral/nav/e2b/broker.jsp?uTem=bff71055-bb1d-50f1-2860-72700266cb59&uCon=6a648ff1-1199-bf33-62d61611142c388e&uBasVariantCon=ed83d448-9a76-4e11-8a5b-28e46ce02000 (Stand: 07.12.2010).

[KMC05] Krüsmann, M. & Müller-Cyran, A. (2005): Trauma und frühe Intervention. Möglichkeiten und Grenzen von Krisenintervention und Notfallpsychologie. Reihe Leben lernen, Vol. 182. Stuttgart: J. Pfeiffer Verlag.

[K04]   Krüsmann, M. (2004): Welche Hilfe brauchen Helfer? - Prävention im Einsatzwesen. In: W. Müller, U. Scheuermann (Hrsg.) Praxis Krisenintervention. Ein Handbuch für helfende Berufe: Psychologen, Ärzte, Sozialpädagogen, Pflege- und Rettungskräfte. (S. 278-288). Stuttgart: Kohlhammer.

[LA10] Lasogga, F.,von Ameln, F. (2010): Kooperation bei Großschadensereignissen. Problemlagen und Entwicklungsperspektiven eines komplexen Organisationsnetzwerks. Gruppendynamische Organisationsberatung, 41, 157-176.

[S06]   Schaub, H. (2006): Störungen und Fehler beim Denken und Problemlösen. Enzyklopädie der Psychologie, Themenbereich C, Theorie und Forschung. Ser 2, 447–482.