

# Embedding Unaffiliated Volunteers in Crisis Management Systems: Deploying and Supporting the Concept of Intermediary Organizations

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## ABSTRACT

Citizens engaging in crisis management spontaneously and without affiliation to an (honorary) aid organization are a social phenomenon on the rise. Even though public engagement is desirable, it receives mixed reactions by crisis management experts. They claim that “the crowd” has to be managed to ensure a successful crisis response and recovery, leading to high coordination efforts which cannot be achieved by the authorities. To understand the obstacles in cooperation and to overcome them better, this study examines existing patterns of cooperation. The study employed in-depth interviews (n=13) in two use cases (flooding, n=4; migrant crisis, n=9) with public authorities, aid organizations and engaged citizens. Results indicate that collaboration works successfully when an intermediary organization bridges the coordination gap between authorities and the public. In addition to the concept of intermediary organizations, two ICT approaches supporting collaboration in crisis events are described: Public Displays and the so-called ‘Security Arena’.

## Keywords

Crisis, Disaster Control, Civil Society, Embedding Unaffiliated and Spontaneous Volunteers, Intermediary Organizations

## INTRODUCTION

In case of emergency or disaster, in most nations three different groups of people come to the fore: (1) the professional public authorities with security responsibilities, emergency services and private aid organizations with a high level of responsibility for most of the tasks during the response and recovery work, (2) the honorary emergency services and aid organizations that are quite similar to and often perceived as equal to paid ‘professionals’, and (3) engaged citizens who offer their help in various ways during events of crisis. Even though civic engagement is a noble gesture, engaged citizens are quite often not perceived as equal. In many cases, public authorities and aid organizations share an attitude towards them as “the crowd to be managed”.

At the same time and as a result of an aging society, demanding jobs, the challenge of work-life-balance, and more frequent relocations in the course of life, the interest in a long-term bond to an honorary office in disaster control has receded in many regions (Angermann & Sittermann, 2010; Cronenberg, 2015; Gensicke & Geiss, 2010). Honorary aid organizations suffer from a considerable decline in new memberships, and in Germany, the suspension of the mandatory military and civilian service has further tightened the situation (INKA-Forschungsverbund, 2015). Thus, unaffiliated and spontaneous civic engagement plays an increasingly important role in disaster control and crisis management. In line with this, several events of natural disaster, like the European flood in 2013, and the European migrant crisis in 2015 have sparked tremendously spontaneous

civic engagement. Unaffiliated volunteers who were not part of the honorary aid organizations or public authorities in charge, offered their resources and joined forces to fill sandbags or assemble camp beds for refugees. Quite often, those volunteers communicated with each other and coordinated their activities via social media services like Facebook and Twitter or via messaging services like WhatsApp, encouraging family and friends to engage. Even though public authorities and aid organizations have been confronted with spontaneous and unaffiliated civic engagement for quite some time, the scale, rapidity and ways of organization is a recent phenomenon.

Paradoxically, this desirable engagement received mixed reactions by disaster control and crisis management experts. Although attitudes have shifted in recent years and the boundaries of their activities are blurring, previous research (INKA-Forschungsverbund, 2015) has shown that the group of engaged citizens is still only slightly into crisis management processes. Even though experts assess embedding spontaneous and unaffiliated volunteers into crisis management processes as strategically relevant to their organizations, they claim that high management and coordination efforts, a lack of training as well as legal and cultural issues interfere with integration. In addition, detailing an operational plan without having evidence how many volunteers show up in a specific crisis situation challenges the integration and systematic involvement. Thus, the resources of the civil society quite often remain untapped and the emergence of community strength and resilience (Berkes & Ross, 2013) is constrained.

Therefore in our paper, we intend to introduce an organizational concept as well as ICT tools which are able to support an effective and efficient integration of the public into crisis management processes. We first present the theoretical background and related work with regard to emergent citizen groups in events of disaster (Section 2). Based on an extensive empirical study (Section 3), we then derive and describe the organizational concept of intermediary organizations which assume to occupy the position of a mediator between public authorities and emergent citizen groups (Section 4). Subsequently, we present ICT approaches supporting the establishment and deployment of intermediary organizations in events of crisis (Section 5), and point out how these concepts can support the development of collaborative resilience as an overall goal (Section 6).

## THEORETICAL BACKGROUND

As summarized by Dunn (2015), early work of Prince (1920) or Deacon (1918) has already examined collective behaviors during disasters. They have revealed that disasters are events in which extensive mixed collective behavior can be observed which occurs as new and different to everyday behavior (Perry & Quarantelli, 2005). Deacon (1918) observed that “immediately and spontaneously neighbors and fellow-townsmen spring to the work of rescue and first aid”. Dynes (1970) produced a fourfold typology of organized behavior in disasters (Figure 1). This typology classifies organizational behavior based on the two dimensions ‘structure’ as well as ‘tasks’ and encompasses organized behavior as established (regular tasks, old structures), expanding (regular tasks, new structures), extending (non-regular tasks, old structures), and emergent (non-regular tasks, new structures).

		STRUCTURE	
		OLD	NEW
T A S K S	Old	Type I Established	Type II Extending
	New	Type III Expanding	Type IV Emergent

Figure 1: Organizations in Disasters (Dynes, 1970)

As Quarantelli (1995) argued, early studies mainly focused on the first three types of organizational behavior during disasters and only few studies have researched emergent behavior in a systematic way. These few studies, however, focused mainly on “later stage conditions associated with crystallization and institutionalization, rather than on the characteristics of emergent groups, and the early stages of emergence” (Quarantelli, 1984). Stallings & Quarantelli (1985) describe the early and often spontaneous forms of citizen-

based crisis management, with new structures as well as new tasks, as „emergent citizen groups” which are characterized as “emergent groups (e.g. unaffiliated volunteers) [which] undertake activities that were previously foreign to them and develop a social structure that lacks formalization, tradition and endurance” (Stallings & Quarantelli, 1985). These emergent groups are therefore characterized by a new (social) structure with new goals and tasks in their response to an emergent situation. Only if both requirements (a new structural arrangement and the undertaking of tasks which were new to the group) are fulfilled, the arising collective citizens’ initiatives are properly referred to as emergent groups (Stallings & Quarantelli, 1985). Emergent groups range “from ephemeral teams of neighbors attempting search and rescue, to community residents organizing themselves to force removal of potentially hazardous waste sites or nuclear plants, to disaster victims getting together to pressure officials to take preparedness and mitigation measures for probable reoccurrences of the floods and landslides they have just experienced” (Stallings & Quarantelli, 1985).

It should be noted that civic engagement also takes place within various organizations which are already established. Thus, emergent citizen groups are “only part of the full range of emergent phenomena to be expected before, during, and after disaster threats and impacts” (Stallings & Quarantelli, 1985) and often private citizens initiate new groups based on their already established work roles. On the other hand, organizations often arise from emergent groups. Stallings & Quarantelli (1985) outlined that one necessary condition for the emergence of citizen groups *during* a disaster is a perceived need or demand which requires immediate action. Emergent phenomena occur when those needs and demands are not met by existing organizations (Heide, 1989). And especially during disaster, the public authorities with security responsibilities can “experience such a rapid and unexpected increase in demands that they lack capabilities to deal with them” (Parr, 1970). Here, inter-organizational coordination and the confrontation with disaster produces demands far beyond the organizations’ routine capabilities, and as a result poses several problems (Stallings & Quarantelli, 1985; Ley *et al.*, 2012).

Emergent citizen groups are not inherently in opposition to the public authorities with security responsibilities and most of the groups start out with “the notion that public officials will be on their side once their attention is called to the issue” (Stallings & Quarantelli, 1985). Nevertheless, when considering the perception of emergent citizen groups by crisis management experts, it is obvious that emergency services “often do not take them into account in community emergency management planning and misunderstand both the reasons behind their emergence and the roles they play in disaster-related community problems” (Stallings & Quarantelli, 1985). Although public authorities with security responsibilities and aid organizations have recognized the relevance and importance of citizen-initiated physical and digital activities, emergent citizen groups are often perceived negatively because the public authorities and aid organizations have not planned for the emergent behavior and therefore cannot ‘control’ as well as manage the groups during events of disaster (Stallings & Quarantelli, 1985).

Identifying, integrating and managing emergent citizen groups in time-critical and uncertain situations are challenging. There often is neither a clearly designated leader, nor a formally assigned liaison or intermediary person for dealing with public authorities and appointed aid organizations which hampers cooperation from the official’s perspective (Stallings & Quarantelli, 1985). As Stallings & Quarantelli (1985) argue, those characteristics make it difficult for others outside of the emergent citizen groups to develop relationships with them. A lot of (inter-)national research projects already aimed at tackling these issues:

Acronym	Focus	Period	Website
A4A: Alert for All	Development of People-Centered Early Warning Systems paradigm	2011-2013	<a href="http://www.alert4all.eu">www.alert4all.eu</a>
ACRIMAS: Aftermath Crisis Management System-of-Systems Demonstration	Developing systematically crisis management systems, procedures and technologies in Europe	2014-2017	<a href="http://www.acrimas.eu/">www.acrimas.eu/</a>
AHA: Automatisiertes Helferangebot bei Großschadensereignissen	Development of a smartphone application for matching volunteers with help requests	2014-2017	<a href="http://www.projekt-aha.hs-ruhrwest.de">www.projekt-aha.hs-ruhrwest.de</a>
EMERGENT: Emergency Management in Social Media Generation	Developing concepts for using social media during crisis management	2014-2017	<a href="http://www.fp7-emergent.eu/">www.fp7-emergent.eu/</a>
Ensure: Verbesserte Krisenbewältigung im urbanen Raum durch situationsbezogene Helferkonzepte und Warnsysteme	Warning and mobilizing volunteers with specialized knowledge in situ	2013-2016	<a href="http://www.ensure-projekt.de">www.ensure-projekt.de</a>
Hands2Help: Resiliente Prozesse durch	Warning and mobilizing volunteers	2013-2016	<a href="http://www.informationsmanagement.wiwi.u">www.informationsmanagement.wiwi.u</a>

IT-Infrastrukturen	with specialized knowledge in situ		<a href="http://ni-halle.de/projekte/hands2help/">ni-halle.de/projekte/hands2help/</a>
INFOSTROM: Lernende Informationsinfrastrukturen im Krisenmanagement am Beispiel der Stromversorgung	Developing a security arena as a cooperation platform between emergency services and the public	2010-2013	<a href="http://www.infostrom.org">www.infostrom.org</a>
INKA: Professionelle Integration von freiwilligen Helfern in Krisenmanagement und Katastrophenschutz	Developing concepts for integrating unaffiliated volunteers into official crisis management	2012-2015	<a href="http://www.inka-sicherheitsforschung.de/">www.inka-sicherheitsforschung.de/</a>
<b>KOKOS: Unterstützung der Kooperation mit freiwilligen Helfern in komplexen Einsatzlagen</b>	<b>Developing concepts and tools for cooperation between emergency services and volunteers</b>	<b>2015-2018</b>	<a href="http://www.kokos-projekt.de/">www.kokos-projekt.de/</a>
KUBAS: Koordination ungebundener vor-Ort-Helfer zur Abwendung von Schadenslagen	Developing a system for automatic communication and registration of volunteers	2016-2019	<a href="http://www.kubas.uni-halle.de/">www.kubas.uni-halle.de/</a>
PEP: Public Empowerment Policies for Crisis Management	Developing public empowerment policies between emergency services and citizens	2012-2014	<a href="http://www.crisiscommunication.fi/pep">www.crisiscommunication.fi/pep</a>
PRAKOS: Praktiken und Kommunikation zur aktiven Schadensbewältigung	Communication concepts between emergency services and the public	2014-2017	<a href="http://www.vfdb.de/forschung/prakos/projekt">www.vfdb.de/forschung/prakos/projekt</a>
RESCUER: Reliable and intelligent use of crowdsourcing information for Crisis Management	Developing technology for reliable and intelligent analysis of crowdsourcing information	2013-2016	<a href="http://www.rescuer-project.org">www.rescuer-project.org</a>
RESIBES: Resilienz durch Helfernetzwerke zur Bewältigung von Krisen und Katastrophen	Developing a network of volunteers that can be activated during emergencies	2016-2019	<a href="http://resibes-osm.cs.upb.de/">http://resibes-osm.cs.upb.de/</a>
TEAMWORK: Krisensimulation für die Zusammenarbeit von Einsatzkräften und Bevölkerung	Using serious games to support training concepts	2016-2019	<a href="http://www.teamworkprojekt.de/">http://www.teamworkprojekt.de/</a>

The research presented in this paper was conducted in the project KOKOS and, as we will show, the concept of intermediary organizations could establish the organizational framework for an appropriate cooperation between emergent citizen groups as well as public authorities with security responsibilities and aid organizations. Thereby, the concept of intermediary organizations offers an indirect way of embedding spontaneous and unaffiliated volunteers into crisis management systems compared to a more direct alternative as described e. g. in ISO/DIS 22319:2016 “Guidelines for planning involvement of spontaneous volunteers”, ISO, 2016).

## EMPIRICAL STUDY

To get first insights into emergent citizen groups as well as their relation to official crisis management processes, we conducted an empirical study consisting of two case studies. Case 1 addresses events of flooding, case 2 investigates the migrant crisis, focusing on the situation at a German and an Austrian train station in summer 2015. Within the case studies, we employed in-depth interviews (n=13, flooding: n=4, migrant crisis: n=9). Interviewees were experts from public authorities with security responsibilities, representatives from aid organizations and engaged citizens.<sup>1</sup> The semi-structured interviews were conducted from September 2015 until February 2016 and addressed the duties and responsibilities of the public authorities, organizations and persons in general as well as in the respective crisis event, the course of action during the respective crisis and the cooperation with other organizations as well as engaged citizens. In addition, the interviewees were asked to assess the course of action as well as the cooperation with others in the respective crisis event. Subsequently, the recordings were transcribed verbatim and thematically coded following the four steps approach applied by Hopf et al. (1995, described in Kuckartz, 2010). In addition, the cases of flooding and migrant crisis were analyzed and compared based on seven pre-defined criteria (actors, experience of actors, organizational structure, direction of control, involvement of spontaneous and unaffiliated volunteers, utilization of civil engagement, and form of cooperation).

### Case 1: Flooding (in Germany)

In events of flooding, roles and responsibilities are clearly defined in Germany. In general, the fire brigade is in charge of disaster control and crisis management and is supported by other (honorary) aid organizations (e. g. German Red Cross (DRK) or the federal agency (THW)) if needed. The cooperation is clearly structured and follows a hierarchical «command-and-control» approach. Decisions are made by the emergency task force and are carried out by subordinated teams. The firefighters are usually quite experienced and trained to manage floods, especially in regions where events of flooding occur quite frequently. In some cases, spontaneous and unaffiliated volunteers offer their resources and support but usually the cooperation is not institutionalized and works, if at all, on call. In the interviews, representatives from public authorities with security responsibilities and aid organizations claimed that embedding spontaneous and unaffiliated volunteers into crisis management systems in general leads to high communication and coordination efforts which cannot always be achieved. As a consequence, the resources and capabilities of those volunteers usually are not fully utilized.

However, the case of Wertheim, a city in the region of Bavaria in Germany, indicates that this does not have to be a rule: As Wertheim gets struck by flooding recurrently an emergent group of citizens has joined forces and founded the association *Bürgergemeinschaft Hochwasser Wertheim e. V. (BgHW)*. The association aims at supporting the public authorities, especially the fire brigade, as well as aid organizations in case of flooding in Wertheim, is open to all community members and interested citizens and is highly acknowledged by public authorities. In order to allow and support close collaboration and exchange of information in the event of flooding, the fire brigade has invited representatives of the association to become permanent members of the emergency task force. Thereby, the representatives of the association get first-hand information by the authorities which they can use to coordinate the activities of their members. In addition, the representatives can provide first-hand information from the civil society to the authorities. Hence, the volunteers get informed and appointed to those activities where their help is needed the most and the public authorities are aware of the public needs and issues. With this special practice of cooperation, closing of ranks between public authorities with security responsibilities as well as aid organizations and the civil society is ensured and the resources of the civil society are utilized more efficiently. As a result, both the authorities as well as the members of *BgHW* evaluate the cooperation as successful, well-rehearsed and enduring.

### Case 2: Migrant Crisis at (German and Austrian) Train Stations

The case of the migrant crisis presents itself quite differently. In the summer of 2015, hundreds and thousands of refugees arrived each day in Europe. At the train stations e. g. in Germany and Austria hundreds of refugees arrived daily in trains which were chartered by the authorities of other European countries, e. g. Hungary, to

<sup>1</sup> For case study 1 (flooding in Germany), we interviewed a local representative of a public authority with security responsibilities, a head of unit of a city administration, the founder of an initiative brokering spontaneous volunteers to aid organizations, and the chairman of the association *BgHW*.

For case study 2 (migrant crisis at German and Austrian train stations), we interviewed a spokesman of a public authority with security responsibilities, a division and a project manager as well as a coordinator for volunteers of three aid organizations, two regular employees of aid organizations, two spontaneous volunteers and founders of an intermediary organization as well as a priest coordinating voluntary programs.

distribute the asylum seekers within the European Union. Media have drawn considerable attention to this political and social turmoil. As a result, hundreds of spontaneous and unaffiliated volunteers turned up at the train stations to welcome and support the refugees. Interviewees from both sides, representatives from public authorities as well as engaged citizens, perceived the situation at the respective train station to be somewhat chaotic at the beginning. Aid organizations and public authorities with security responsibilities were on site, but especially in the first hours their roles and responsibilities were not clearly defined at all. Interviewees from public authorities and aid organizations in Germany claimed that clear political directives were missing. The interviewed citizens explained that the spontaneous and unaffiliated volunteers realized this shortcoming and tried to bridge the gap by supplying the refugees with food, clothing, and information themselves. They also shared that most of the volunteers had little to no experience in humanitarian aid or working with refugees. Yet, the volunteers worked on call and decided intuitively what to do next. According to the interviewed citizens as well as representatives from public authorities, the activities were organized and directed bottom-up – and unfortunately bypassed the public authorities and appointed aid organizations quite often. On the other hand, the interviewed citizens accused the public authorities who have often failed to involve the volunteers into their activities on site and to institutionalize cooperation, especially in the beginning. As a result, both sides described that they experienced some frustration particularly during the first hours and days of activity at the train stations.

However, the examples of Frankfurt, Germany, and Vienna, Austria, show that collaboration can work even in this novel and chaotic kind of situation. In both cases, the spontaneous and unaffiliated volunteers have organized themselves over time and have built a network (called *Second Planet* in Frankfurt and *Train of Hope* in Vienna) with clear structures, roles and responsibilities as well as communication channels. Once identified by the public authorities and aid organizations as a properly functioning emergent citizen group which is able to coordinate and manage itself, the authorities pursued cooperation and started to work closely together to achieve common goals. Both authorities as well as emergent citizen groups in Frankfurt and Vienna described the teamwork as successful, effective and amicable once the chaotic phase with unclear roles and responsibilities was overcome. Due to this positive experience and in order to further support the social integration of refugees, *Second Planet* has in the meanwhile registered as an association.

#### INTERMEDIARY ORGANIZATIONS: AN ORGANIZATIONAL CONCEPT

In Wertheim (flood), Frankfurt and Vienna (migrant crisis) public authorities with security responsibilities and aid organizations successfully integrated the public in disaster control by outsourcing the registration, coordination and management of the engaged citizens to a third organization. The registered association *BgHW* bundles the resources of the engaged citizens, coordinates their activities, and matches supply and demand for assistance. Thereby, *BgHW* offers a kind of a service to the authorities. In the migrant crisis, the emergent citizen groups *Second Planet* and *Train of Hope* have demonstrated to be effective intermediary organizations, too, taking over registration, coordination and management of volunteers and, thereby, functioning as interface between the public authorities and the volunteers. Drawing on these empirical findings and to promote the transfer of the concept to other use cases, we have derived, developed and defined the concept of integrating unaffiliated and spontaneous volunteers in crisis management processes (for Germany) through an intermediary organization as follows:

« The organizational concept of intermediary organizations describes a form of structured involvement of the public into crisis management systems for the purpose of preventing and/or managing a crisis situation. In this form, the public authorities with security responsibilities and aid organizations outsource the coordination and management of individual (e.g. spontaneous, unaffiliated volunteers) and collective volunteers (e.g. associations, enterprises) to a third party in order to conserve its own resources while, at the same time, making the competencies and capacities of the civil society accessible.

An intermediary organization supports the prevention and/or management of a crisis on behalf of the authorities and cooperates with public authorities with security responsibilities and aid organizations for this purpose. It assumes the task of structuring and coordinating already existing, unaffiliated civil engagement before and/or in a crisis situation and, if necessary, creating a point of entry for new, spontaneous engagement. In this way, the intermediary organization supports the professional integration of low-threshold forms of civil engagement into crisis management systems which are independent of a long-term honorary office.

To effect insurance for all (temporary) members, the intermediary organization has to be (informally) designated as such by the Lower Disaster Prevention Agency and/or the responsible public authority or aid organization before or during a concrete crisis situation. This informal act promotes an intermediary organization to a temporary public assistant, subordinated to the Lower Disaster Prevention Agency and/or the public authority or aid organization in charge. With this, intermediary organizations do not have to cover for damages caused by them negligently. Instead, it becomes an official liability. In addition, intermediary organizations and their

members profit from statutory accident insurance. In case of malpractice, the Lower Disaster Prevention Agency and/or the responsible public authority or aid organization is lawfully authorized to dismiss the respective intermediary organization or individual. In order to be on the safe side with regard to legal aspects, registration of the members of intermediary organizations is advisable but not mandatory.<sup>2</sup>

An intermediary organization can emerge from an already existing civil society structure (such as a sports club or a church community) or can be newly founded for the purpose of preventing and/or managing a crisis situation. It can emerge from a citizen's initiative or be initiated by the authorities. In any case, an intermediary organization is a voluntary association of individual and/or collective civil society actors and acts as an intermediary between public authorities and the civil society. Thereby, it sets its focus on embedding the civil society as a resource and an active partner into crisis management systems. »

In practice, *BgHW*, *Second Planet* and *Train of Hope* have demonstrated ways in which an intermediary organization can emerge, structure and organize itself and support embedding emergent citizen groups and other unaffiliated volunteers into crisis management systems. In all three cases, public authorities with security responsibilities and aid organizations have benefited from the cooperation with the intermediary organization to such extent that they were able to access the diverse resources and competencies of the civil society without having to devote own resources to the coordination of the volunteers. Instead, the authorities only had to ensure the exchange with a contact person at the intermediary organization which served as a multiplier to the volunteers. Citizens also benefited from the intermediary organization as a dedicated contact point which they could turn to for engagement in a crisis situation. Also, the intermediary organizations assumed the role of a social and cultural bridge between the «command and control» approach of the public authorities and aid organizations and the flat hierarchies, the spontaneous and adventurous spirit of the volunteers.

### COLLABORATIVE RESILIENCE: IT-TOOLS TO SUPPORT COLLABORATION BETWEEN AUTHORITIES, INTERMEDIARY ORGANIZATIONS AND VOLUNTEERS

To support the development and operation of intermediary organizations as well as their coordinative work in crisis situations, we have developed a public display application, called City-Share (Ludwig et al., 2016). The aim of City-Share (Figure 2) is to crowdsource relief activities to unaffiliated volunteers and emergent citizen groups from a place-centric perspective within neighborhoods. The public display offers functionality to support self-help amongst the civil society itself mediated by intermediary organizations simultaneously supporting the alignment of voluntary activities with those of the public authorities with security responsibilities as well as aid organizations.

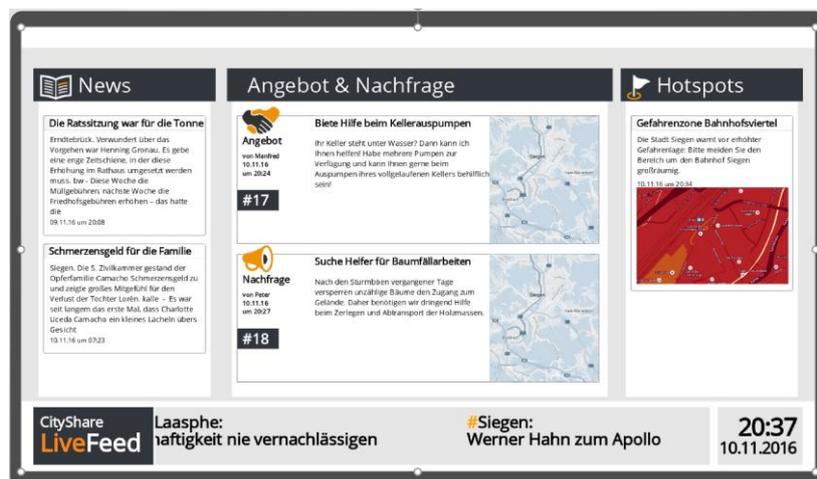


Figure 2: Situated crowdsourcing for managing voluntary tasks (Ludwig et al., 2016)

The public display application should be placed at central locations e.g. train stations or other highly frequented places to reach a large audience and serve as a first contact point for spontaneous and unaffiliated volunteers. A network of such displays spread through an entire city poses an effective communication infrastructure for

<sup>2</sup> For further legal information regarding Germany, please see the work of Erkens (2016a; 2016b).

coordinating activities of emergent citizen groups. In case of infrastructure breakdown such as loss of internet or electricity, the system is able to partly continue its work. To prevent power outage for a while, uninterruptible power supply has to be provided, either via placing the display within a hospital or another institution that provides this kind of service or separate devices at the respective place have to be installed. In case of internet breakdown, the system is still able to provide a local Wi-Fi for interaction. The information will then be transferred via the users' smartphones when they pass by other users or public display systems. To support coordination between spontaneous and unaffiliated volunteers and local (affected) citizens, the public display offers the sharing of requests for help as well as the offering of support as a main functionality. Spontaneous and unaffiliated volunteers are able to answer requests from affected citizens (or any other organization) describing how many they are and what they are capable of or willing to do, where and how long they are available, etc. This kind of coordination of spontaneous and unaffiliated volunteers is supplemented by local "hotspots" that serve as physical contact points of responsible public authorities or aid organizations as well as news from various sources such as newspapers and social media. Social media are usually used for coordinating relief activities during crisis situations wherefore spreading it to the public helps raising awareness for voluntary activities. Additionally, the public display offers a live feed at the bottom of the screen to visualize important news (e. g. created by intermediary organizations) or warnings (created by public authorities).

In terms of the control center, public authorities with security responsibilities and aid organizations are able to configure what news channels or hashtags to subscribe to and what local hotspots should be presented. They can create warnings as well as any other type of message to be shown in the news feed. While using the public display, public authorities can increase awareness for their own local activities as well as align their own activities with those of the volunteers – and vice versa. By monitoring the public display, public authorities get awareness for e.g. loosely structured, emergent citizen groups that are very active or seem to be plausible candidates to be promoted to intermediary organizations.

In addition to the public display system, the socio-technical concept 'Security Arena' (German: Sicherheitsarena) provides organizational and communicative-medial measures to improve 'readiness', 'preparedness' as well as 'copability' in events of crisis by providing public authorities and the general public a platform to cooperate and exchange ideas in everyday life (Ley et al., 2014; Pipek et al., 2013). By inviting e. g. fire brigades, aid organizations, private initiatives and associations, companies, men, women, press and media to discuss ideas with regard to their respective neighborhood or local events, the 'Security Arena' institutionalizes the cooperation of so-called local security-communities and the public, enabling the emergence of cooperative relationships which can prove helpful in events of crisis. By institutionalizing cooperative relationships in everyday life, joint work routines, patterns of communication and structures of cooperation can be established on an inter-organizational level, paving the way for joint planning, acting and learning also in crisis situation. Specifically, the 'Security Arena' aims at offering communicative-medial instruments to facilitate and promote the development of sustainable (dialogical) communication practices, to share information and to establish a joint information management, and to foster cooperative learning processes as well as skill development. Ultimately, 'Security Arena' strives to increase collaborative resilience by integrating and embedding the public into crisis management systems.

The basic component of the 'Security Arena' concept is a web-based inter-organizational social network called SiRena (Figure 3), providing various modules to support cooperation and collaboration going beyond common social media functionalities. Besides user profiles, access control, and basic communication functionalities, groups are the main element of the system. Providing a platform to meet fellow citizen, exchange and discuss ideas and jointly work on projects, this SiRena functionality especially encourages the emergence of citizen groups. Thereby, SiRena offers both open and closed groups. Open groups are accessible to all SiRena members, allowing them to follow and engage in ongoing discussions and see who the other members of the group are. In closed groups, interested SiRena members need to request access or have to be invited by a group member. This kind of group is designed to discuss sensitive matters and content where data protection is the key. In crisis situation, this feature is especially valuable. In addition to groups, other collaborative functionalities are implemented e. g. collaborative file handling (including the creation, management, editing and exchange of documents, media and files), a joint calendar, a discussion forum and an activity stream that filters existing activities based on defined tabs. To communicate, the system provides both an internal messaging system and a chat. The access to SiRena is designed as a walled garden which means that it requires an invitation by a SiRena member.

Based on this set of functionalities, SiRena supports (a) the interlinkage of different organizations in a safe environment, (b) informal communication, (c) the search for experts, (d) document-sharing between different work groups and organizations, (e) the aggregation and presentation of external information, as well as (f) the development of joint situation pictures. Originally customized to facilitate collaboration between public authorities with security responsibilities and solo helpers as well as emergent citizen groups, SiRena can also

support the coordination work of an intermediary organization with a much higher organizational level as the functionalities are compatible.

**Legend:**

1 main menu / navigation bar	5 group news feed / private subscription
2 filter, search and lookup function	6 member network area
3 personal login details	7 instant messaging
4 user settings / rights management	

**Figure 3: SiRena – Social network offering collaborative functionalities (own illustration)**

The concept of intermediary organizations and its supportive (often crowd-based) tools such as the situated public display application City-Share or the inter-organizational platform Security Arena encompass different levels of responsibility (volunteers, official) as well as different types of located information sources. Intermediary organizations can therefore foster community's disaster resilience, especially when focusing on the situated kind of collaborative resilience emerging between professional public authorities with security responsibilities, emergency services and private aid organizations as well as the spontaneous volunteers. 'Disaster resilience' can be understood as the "ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stress – such as earthquakes, drought or violent conflict – without compromising their long-term prospects" (Department of International Development, 2011).

Based on the concept of disaster resilience (Department of International Development, 2011), collaborative resilience aims at supporting disaster resilience by a strong cooperation between all involved stakeholders such as public administration, public authorities with security responsibilities and aid organizations, but also affected citizens as well as spontaneous volunteers (Goldstein, 2011). The intermediary organizations could serve as a cooperative and vital link between those stakeholders. Establishing collaboration through intermediary organizations between the "private and public sectors could improve the ability of a community to prepare for, respond to, and recover from disasters" (National Research Council, 2011).

## CONCLUSION

In literature, research and practice, numerous recommendations and approaches can be found on how to embed the public and especially spontaneous and unaffiliated volunteers in disaster control and crisis management. And the technical tools to support cooperation are manifold, too. The concept of collaboration through an intermediary organization is intended to describe one possible way, bridging the cultural gap between public authorities with security responsibilities and aid organizations on the one hand, and the engaged citizens on the other. The concept of intermediary organization thus provides an alternative to the direct embedment of spontaneous and unaffiliated volunteers in the structures of the civil protection and humanitarian support organizations (as e. g. described in ISO/DIS 22319:2016 “Guidelines for planning involvement of spontaneous volunteers”, ISO, 2016).

Of course, the concept of embedding the engaged public in disaster control through intermediary organizations comes not without risk. In order to enable public authorities and aid organizations to work together with an intermediary organization, the (political) framework has to be defined, processes and rules of cooperation have to be created, tasks specified and roles clarified. In addition, scenarios and fields of application where this way of cooperation is useful need to be identified. Further, the obstacles that come with organizational change must be overcome by public authorities and aid organizations. To support this process, it is necessary to make suitable organizational and technological tool kits available to the authorities and aid organizations. This includes context-sensitive instructions how to design processes of collaboration as well as appropriate training concepts to prepare the authorities and their members to cooperate with intermediary organizations. In addition, it is necessary to provide a comprehensive manual for intermediary organizations and their members which enables them to carry out specific tasks ad-hoc in a concrete crisis situation and in line with the principles of disaster control.

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