Opportunistic Affiliation in Spontaneous Volunteer Management

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ABSTRACT

Spontaneous volunteers influence crisis and disaster relief efforts as both an effective aid and a stressing factor for emergency organisations. Managing the negative impacts of spontaneous volunteering has thus become part of command and control deliberations. In this paper, we take a closer look at integrating spontaneous volunteers into the formal response system to mitigate negative impacts. Working with participants from formal response organisations, we gathered qualitative data regarding the management of spontaneous volunteers during the European migration crisis in 2015. Through thematic analysis, we extracted topics to systematically describe the interaction between emergency organisations and spontaneous volunteers. As implication thereof, we propose how computer supported systems can be applied to better manage spontaneous volunteers. In our discussion, we focus on the registration process and *ad hoc* verification of spontaneous volunteers to better integrate them in the formal response process.

Keywords

Crisis and disaster management, spontaneous volunteers, command and control, volunteer management

INTRODUCTION

Volunteers have a considerable impact in Crisis and Disaster Management (CDM), which is particularly true for spontaneous volunteers. Spontaneous volunteers have no affiliation to formal organisations and participate to address sudden, urgent needs. The nature of their role, and whether their activity should be supported or suppressed, is subject to debate. On the one side, proponents of a top-down approach, leaning towards the command and control paradigm, at times consider spontaneous volunteers a hindrance or nuisance (Cone et al., 2003; Sauer et al., 2014; Whittaker et al., 2015). On the other side, spontaneous volunteers are often the first, and a very important, form of relief in the immediate aftermath of an incident (auf der Heide, 2003; Twigg & Mosel, 2017; Whittaker et al., 2015). Whatever side one may prefer, research has shown that the appearance and convergence of spontaneous volunteers at the disaster site can have negative side effects for organised relief efforts (Dynes, 1994b; Fritz & Mathewson, 1957; Sauer et al., 2014). As the presence of spontaneous volunteers is a common aspect of CDM (auf der Heide, 2003; Drabek & McEntire, 2003; Twigg & Mosel, 2017; Whittaker et al., 2015), response efforts should incorporate spontaneous volunteers in their decision making (Barsky et al., 2007). However, the rather static and bureaucratic command and control model is not well suited for spontaneous and loosely organised relief efforts (Drabek & McEntire, 2003) and needs adaptions to lessen negative effects of spontaneous volunteering while strengthening their problem-solving capabilities.

In this paper, we present the results of our research on the necessity and nature of adaptions to the command and control model, to better accommodate spontaneous volunteers. These results were abducted through thematic analysis on qualitative research data: interviews and group discussions were conducted in the context of the European migration crisis in 2015. The contribution of our work is the systematic description of four distinct dynamics that affect spontaneous volunteer management. Further, we describe and discuss possible technological approaches implicated by these dynamics.

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RELATED WORK: CIVIL SOCIETY IN CRISIS AND DISASTER RELIEF

The importance of citizens' initiative in relief work, especially in the early phase, has been emphasized repeatedly, starting with one of the earliest works in disaster sociology (auf der Heide, 2003; Dynes, 1994b; Helsloot & Ruitenberg, 2004; Prince, 1920; Twigg & Mosel, 2017; Whittaker et al., 2015). However, from the perspective of formal organisations for crises and disaster relief such initiatives are not always seen positive, as they are hard to control and difficult to plan for (Sauer et al., 2014; Skar et al., 2016). Formal organisations have previously been reported to primarily follow procedures aimed at establishing order after the chaos of a crisis or disaster (Dynes, 1994a). Yet research does not support the need to control antisocial and destructive behaviour in the face of a crisis (Drabek & McEntire, 2003; Helsloot & Ruitenberg, 2004). On the contrary, researchers have considered informal activities essential for effective, if not necessarily efficient, relief (Dynes, 1994b). This creates a situation where civil society provides the required resources, yet in a form of response that is inefficient (Dynes, 1994b). Harris et al. (2017) describe the role of spontaneous volunteers as *paradoxical*, in that they are simultaneously needed and not wanted by crisis managers. This conflicting situation results in a need to manage the activities of citizens in a way that reduces inefficiency, while allowing flexibility.

Spontaneous Volunteers and Convergence

Formal organisations in CDM use the term *volunteer* primarily to describe persons that contribute through predetermined structures of an official response body (Whittaker et al., 2015). This definition makes volunteers part of the formal response system, where they act in accordance with established procedures. Through regular service volunteers get socialised in the field of CDM. This form of volunteerism is traditionally popular in Central Europe and Scandinavia with levels of participation in voluntary or charitable organisations regularly exceeding 50% of the population, reaching 67% in Norway (Plagnol & Huppert, 2010). Britton (1991) refers to such organised and affiliated volunteers as *permanent disaster volunteers*.

A trend contrary to permanent disaster volunteers has been noted at the turn of the century: volunteering 'decreasingly corresponds to strong identification and long-lasting membership' with organisations (Hustinx & Lammertyn, 2003). Indeed, there has been a noticeable number of publications addressing volunteers that contribute to disaster relief without joining an official response organisation. Various terms have been used for such participation, including: *informal* (Whittaker et al., 2015), *unaffiliated* (Barsky et al., 2007; Zettl et al., 2017), *episodic* (Hyde et al., 2014; Starbird & Palen, 2013), *freelancing* (Cone et al., 2003) or *spontaneous* (Harris et al., 2017; Sauer et al., 2014; Simsa et al., 2018; Twigg & Mosel, 2017). While these terms are not mutually exchangeable, they all describe volunteers who are active outside the formal response system; even though they occasionally are integrated into formal efforts (Scanlon et al., 2014). Spontaneous volunteers (as we refer to them in this paper), who may lack both training and equipment, pose an issue for official response organisations, as they may endanger their own health and disrupt organised response (Whittaker et al., 2015).

One phenomenon of spontaneous volunteering is *convergence*: the physical movement of persons or material towards the disaster site, as well as the transmission of information and requests towards communication centres of a disaster site (Fritz & Mathewson, 1957). In our research, we are primarily interested in the convergence of persons[1]. Spontaneous volunteers are motivated to render aid and offer support, and so they will mobilise and move to the incident site (Dynes, 1994b). This individual and unorganised mobilisation can cause congestions of persons and vehicles, posing an additional logistical challenge for official crisis management (Drabek & McEntire, 2003). Convergers may 'overrun' local infrastructure (Fritz & Mathewson, 1957), deplete resources (Cone et al., 2003) or overwhelm those trying to coordinate response (Drabek & McEntire, 2003). An over-abundance of helpers in the disaster area may even engender more victims (Dynes, 1994b). Emergency and relief organisations have adopted concepts to address personal and material convergence. Examples are the Volunteer Reception Center of the US Federal Emergency Management Agency or the Operations Coordination Centre, employed by the United Nations Office for the Coordination of Humanitarian Affairs. Both are concepts intended to cover the reception of individuals or whole organisations, respectively. While (some) organisations have procedures at hand to handle physical convergence, Waldman and Kaminska (2015) propose virtual reception centres, which could yield benefits for both volunteers and formal relief organisations. However, little literature is available on digitalisation of volunteer reception on site.

If spontaneous volunteers' convergence on a disaster site is inevitable, then their participation in relief efforts should be actively managed – to prevent injury or damage, to reduce disruption of organised response, and to

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[1] The convergence of goods and information impose their own. separate problems; relating to supply chain management and information management, respectively. Even 'official' convergence is problematic (Dynes, 1994b; Fritz & Mathewson, 1957).

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increase effectiveness of CDM (Sauer et al., 2014; Whittaker et al., 2015).

Efforts of Civil Society during the Migration Crisis in Austria

September 4th, 2015, saw the beginning of the 'March of Hope', which heralded the height of the migration crisis for Central Europe: over 500 people, on their way westwards to seek refuge, broke their immobilisation near Budapest's main train station by proceeding on foot towards Austria (Kallius et al., 2016; Kornberger et al., 2018). This led the Austrian state to open its borders. Subsequently, efforts of the civil society played an essential role in providing aid and shelter for newly arriving migrants, thereby averting a humanitarian catastrophe (Simsa, 2017). A lack of response from state institutions prompted collective action of citizens – for example, humanitarian relief at Vienna's main train station was operated by a volunteer movement that had not existed before (Kornberger et al., 2018). This was a highly visible, if just one of many, examples of citizen activism to cope with the influx of refugee seekers. Approximately 300,000 would cross the borders of Austria (population 8.7 million) until the end of the year, posing a continuous humanitarian and logistical challenge (Kornberger et al., 2018).

METHODOLOGY: STUDY

This study was set up immediately following the extensive efforts of civil society during the migration crisis in 2015. We investigate the following research questions from the viewpoint of the formal crisis response system:

RQ1 How was the spontaneous volunteer effort during the recent migration crisis perceived by representatives of the formal response system?

RQ2 What organisational structures, measures, or tools were in place to integrate spontaneous volunteers into formal relief efforts?

RQ3 What were the obstacles encountered in the integration of spontaneous volunteers into formal relief efforts, if any?

To address these questions, we conducted two group discussions and two complementary interviews. Both group discussions were held with representatives of formal organisations that provided disaster relief as part of their ongoing work. Interview partners were representatives from public agencies, mediating between formal organisations and volunteers. The participants and their referential identifications are given in Table 1.

Affiliation	Participants	Method	Denotation
Formal relief organisation	CDM professionals from tactical and operational levels who worked with volunteers over the course of the migration crisis.	Group discussion	*<f-1>…<f-6>*
Mediation agency	Persons in leading roles who work to conciliate formal organisation's open volunteer positions and citizens who want to become active as volunteers	Semi-structured interviews	*<m-1>,<m-2>*

Table 1. Study participants

While group discussions examined the challenges that the formal response system experienced in the involvement of untrained citizens, the interviews investigated mediating agencies and how the crisis changed their work routines. Group discussions and interviews were of semi-structured nature. Detailed questions and guidelines were prepared in accordance with our research questions. However, participants were encouraged to speak freely and were allowed to deviate from the original topic to some degree.

The group discussions and interviews yielded a total of 6.2 hours of audio data. This audio data was transcribed entirely; forming our data set. Eventually, we conducted a thematic analysis (Braun & Clarke, 2006) on this data set. This approach was abductive, i.e., the themes were derived from the data (as opposed to fitting data into pre-existing themes). Coding of the data set was done according to our research questions. Encoded text passages constituted our initial data items. Data items were arranged into *topics* on a semantic level; an exemplary topic is the collection of data items addressing the use of pen and paper to register volunteers on site. Topics can exhibit a high level of inter-connectedness, forming over-arching *themes*. Identifying and describing these themes was the first analytic step not directly based on the original data set.

As themes became entangled with each other, adaptions were needed to disentangle them, while asserting their grounding in the original data set. Some themes were discarded for lack of proper grounding in the original data set, others were merged or split to account for internal variances or contradictions of existing and emerging

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themes. For our analysis, themes provide both a layer of abstraction from original data and a lens through which to view and interpret topics and data items. Thus, the analysis process becomes iterative: as we discover new themes in the original data set, we can look at and interpret previously identified topics and themes from a different perspective. Sometimes this led to adaptions of existing themes. We reiterated this process until individual themes were sufficiently distinct from each other.

Our themes captured organisational and technological aspects of the interaction between volunteers and formal organisations. Themes held answers to our research questions, but did not offer a satisfactory amount of insight about their effect on relief efforts. We introduced the concept of a *dynamic view* to help us derive implications that our themes have; implications for the integration of spontaneous volunteers as an effort by command and control to conduct efficient relief. The dynamic view offers a new lens on our analysis, by asking how each theme affects relief efforts. We ensure a continued relation to our research questions by not changing the themes themselves, but aggregating them based on their meaning for the integration of spontaneous volunteers.

ANALYSIS RESULTS: DYNAMICS OF INTERACTION

Figure 1 is intended to guide the reader through our work via four dynamics (elements III, IV, V and VI). They will form the basis of discussing eventual technological support (elements A and B). The dynamics are rooted in a perceived need to contribute (element I) and affect the efficiency of relief efforts (element VII).
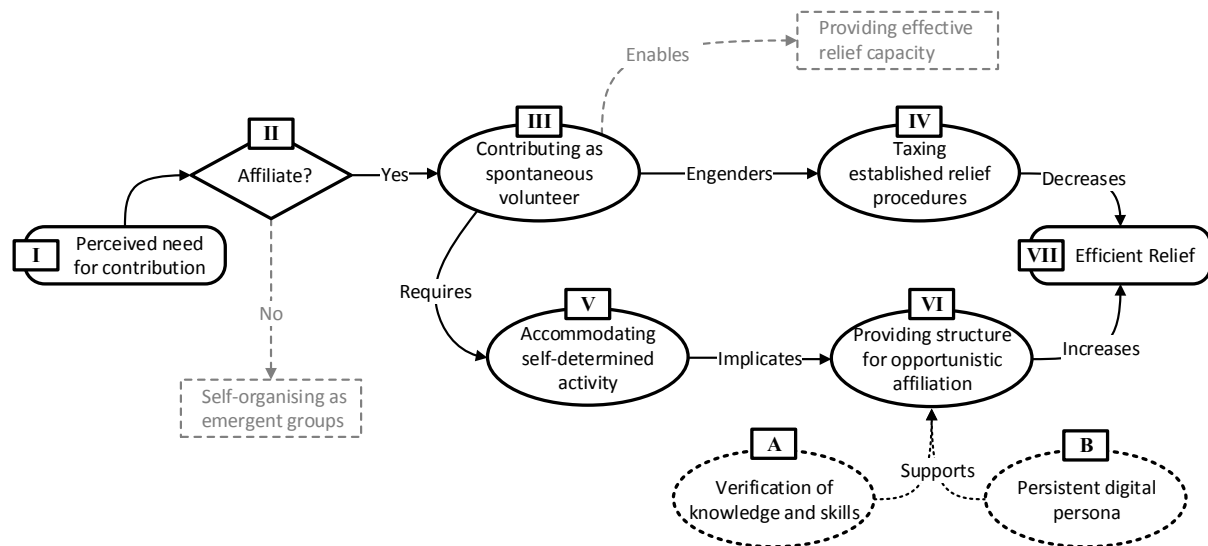

Figure 1. Dynamic view of interactions between spontaneous volunteers and emergency organisations

Motivation to Volunteer (Figure 1, I)

Volunteers in CDM are, per definition (Plagnol & Huppert, 2010; Whittaker et al., 2015), conducting relief efforts of their own free will, without coercion. Thus, their motivation must be intrinsic, i.e., be the result of their own initiative. The actuator, purported by literature (Dynes, 1994b; Lowe & Fothergill, 2003) and affirmed within our own data, is the perception of a need for one's own contribution – to 'do something'. The focus of this paper is on spontaneous volunteers (who are not affiliated with any formal organisation), in contrast to affiliated volunteers (who have registered with a formal organisation).

Becoming a Spontaneous Volunteer (Figure 1, II)

After a volunteer perceives a need for contribution and decides to 'do something', we make a distinction between two forms of volunteer activity. This was articulated by representatives of formal relief organisations in our own data.

> *Like spontaneous volunteers that came to [incident site] and said, 'I have two good hands, put me to work where you need me'. That's a different approach than going 'I drive over there with some soup and then I'll decide where to distribute it, without coordinating'. In my opinion, those are two different demographics. (<f-4>)*

Does a citizen become a volunteer, approach a formal organisation for guidance, or even for orders, or does s/he

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pursue activities of his or her own choice? Deciding for the latter, for whatever reason[2], entails a whole different set of problems, which exceeds the scope of this paper. Instead, we focus on citizens that intend to approach formal organisations, at least for guidance in their efforts, if not outright tasks or orders.

Contributing as Spontaneous Volunteer (Figure 1, III)

Spontaneous volunteers contrast affiliated volunteers (Whittaker et al., 2015) or permanent disaster volunteers (Britton, 1991) in three aspects, as far as our own data is concerned. Firstly, the volunteer decides time and place of their contribution. *<f-1>* recalls that many volunteers chose to participate for a limited time on very short-term notice; giving the example of someone showing up to help for two hours because they missed their train.

Secondly, a 'project-related' *<f-1, f-5>* form of volunteering, whereby volunteers choose the circumstances of their contribution, instead of entering a long-term affiliation with an organisation. *<f-1>* notes how 'the classical volunteer' will disappear over the next decades, while project-related engagement will rise – a trend they increasingly noted during the migration crisis. *<f-5>* concurs by stressing the difficulties in dealing with it.

> *This realisation that you [<f-1>] mentioned, that there are more project-based volunteers,*
> *is also noticeable for us and now there is this reflection: how do you handle that, how can*
> *you integrate that reasonably? (<f-5>)*

Thirdly, confirming previous research by Hustinx & Lammertyn (2003), *<f-5>* states how project-oriented volunteers often relate less to the organisation that provides the frame for their activity:

> *There are many volunteers at work in [relief organisation's] facilities that have basically*
> *no relatedness to [relief organisation]. Indeed, it was the case that some people, primarily*
> *with migratory background, who worked as translators, told me they never heard of [relief*
> *organisation], asking me what that is and if it's a new thing. (<f-5>)*

It stands to reason that the migratory background of volunteers was the reason they never heard of that specific relief organisation. The point, however, is that, in line with the more transitory nature of participation, volunteers may pay less attention to which organisations provides the frame for their contributions. Overall, data gathered from representatives of the formal response system suggest that there is a decreasing socialisation of volunteers in the emergency system.

Taxing Established Relief Procedures (Figure 1, IV)

Spontaneous action of individuals may lead to stress in the formal response system, decreasing relief efficiency through increased administrative overhead or contravening other efforts by unfocused action (Figure 1, IV → VII). Without guidance or information concerning the overall operational picture, spontaneous volunteers may inadvertently undertake actions that contravene other relief efforts (*<f-6, m-2>*). This includes the donation of commodities, the handling of which binds further resources (*<m-2>*). Lack of guidance may be caused by shortage of commanding personnel as well as unawareness (*<f-1, f-3, m-2>*) or unwillingness (*<f-2>*) of volunteers to integrate into command and control structures. A second stressor stems from the administrative overhead when registering newly arriving spontaneous volunteers. Formal organisations require volunteers-to-be to formally register for legal coverage and insurance. This is done mostly on premise, using pen and paper (*<f-1, f-2, f-4>*), binding resources at various levels.

To mitigate the stress of spontaneous volunteer participation, programmes for pre-registration of volunteers had previously been established and technological support attempted, c.f. (Auferbauer et al., 2015, 2016). *<f-1>* states that the purpose of such pre-registration, then, was to not have spontaneous volunteers on site, yet the situation was different during the migration crisis:

> *You couldn't put people to good use if they just showed up then, because they caused more*
> *trouble than they were helping. [...] But that is different now, because now we need people*
> *who come [to shelters] directly. [...] Today, in running operations, when someone comes*
> *over, they are welcomed and invited to start immediately (<f-1>)*

It appears that volunteers who were already enrolled in the organisation's volunteer programme (i.e., pre-

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[2] Including: dissent regarding the objectives set or the way they are to be achieved; a lack of presence of visibility of formal organisations; or personal preference to work apart from hierarchical structures.

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registered volunteers) also queried information in advance; to be briefed where to go and whom to report to (*<f-2, f-4>*). This indicates that even pre-registered volunteers will not necessarily wait for orders and can be part of unwanted convergence.

Accommodating Spontaneous Participation (Figure 1, V)

Formal relief organisations try to accommodate spontaneous participation through their existing organisational structures. Yet sometimes the volume of participation outgrows the expansion capacity of these structures:

> *<f-4>:I hope [regional command] drew experience from this. That we need to educate*
> *and train more people for leadership positions.*
> *<f-3>: Yes, those were lacking-*
> *<f-4> Because helpers we had in great numbers.*
> *<f-3> [...] That's because we in Austria, with our column-oriented system, expect a fixed*
> *number of required leadership positions. But that this system is suddenly expanded and*
> *additional leaders are required for the newly added structures, well ...*

A 'column-oriented system' refers to an organisational structure with more depth than width; where a leader is responsible for the 'column' (of persons) behind them. The more volunteers participate, the more columns (and leaders) are needed, which can ultimately lead to a shortage on persons in commanding (leading) positions. *<f-2>* and *<f-3>* argued for greater scalability of existing structures, to better accommodate large numbers of new volunteers. *<f-1>* suggested using the time between incidents to qualify volunteers for leadership positions.

A faster and more flexible registration process for newly arriving volunteers is one possibility to accommodate spontaneous volunteers (*<f-1>*). In contrast to previous volunteer programmes, where *a priori* registration and training was required, spontaneous volunteers have the option to sign up on premise and subsequently contribute immediately. Registration was done with pen and paper to enable *ad hoc* data collection, due to the easy availability and high reliability of the medium (*<f-1, f-4>*). However, the paper-based medium has issues:

> *<f-2>: But the data of these contributors, do you submit them [into the established*
> *volunteer programme database]?*
> *<f-1>: No, that is currently not planned. At the moment, it is a mountain of paper that*
> *awaits digital inventory.*
> *<f-2>: That is exactly the challenge, yes. Well, such a sheet of paper, that has been*
> *signed, with some data on it – that just piles up somewhere.*

This suggests difficulties in information management and later analysis. Low interoperability of registrations forms between organisations aggravates this issue, as volunteers must repeat the registration processes at every organisation or site they wish to become active at. This, in turn, can lower the acceptance towards the process.

As spontaneous volunteers are not familiar with the nomenclature, procedures, and rules in CDM they need a form of leadership that varies compared to that of affiliated or pre-registered volunteers. Formal response organisations can benefit when allowing the creativity of spontaneous volunteers to manifest. As *<f-6>* puts it: 'Very good ideas come from that [inclusion of spontaneous volunteers], ones that we have not thought about before'. However, they must allow for inclusive styles of leadership.

> *And it worked best with [an inclusive] form of leadership. He [spontaneous volunteer]*
> *would probably have despaired with any commander that first instructs him on how to*
> *park so that the car is pointed toward the direction of escape and that the tank needs to be*
> *three quarters full (<f-6>)*

Providing Structure for Opportunistic Affiliation (Figure 1, VI)

The logical continuation of the accommodation of spontaneous volunteering leads towards providing a framework for what we have named *opportunistic affiliation*. Opportunistic affiliation is the act of utilising the participation structures provided by formal organisations on an *ad hoc* basis. The volunteer decides to 'do something' and acts on this decision by registering with a formal organisation on site. Both the decision and execution happen in a short timeframe. Management of opportunistic affiliation requires corresponding organisational structures. Answering *<f-3>*'s question as to the extent of the term *volunteerism*, *<f-6>* puts it thus:

> *I think you have to look at it as something larger. And that is a task for us as commanders.*

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> *To not think of volunteers only as those who are overly socialised in our field anyway. Those don't need a lot of instructions. They are in the know anyway. It's more difficult with people that joined recently, that come spontaneously or especially the convergent volunteers who are there. For them, I have to provide structures of meaning[3]. (<f-6>)*

The statement implicates that volunteers can exist without formal structures and that structures can exist without a standing corps of volunteers. This represents an empathic view on volunteer management, compared to a traditional command and control approach. It holds formal organisations accountable to provide meaningful structures for spontaneous volunteers.

Participants found it worthwhile to address persons that are not actively looking for participation as part of the formal response system. <m-2> points out that many opportunities to participate are simply not noticeable. <f-1> mentions that 'a lot is being left out on the street. Potential, you know?' and <f-4> adds: 'because nobody asked them.' For this, <f-3> proposes a standardised symbol to signal volunteer opportunities *in situ*. The goal, from the authors' perspective, is not so much to attract persons that would otherwise not have become volunteers; rather, it is to make spontaneous volunteers aware that there are opportunities to become active as part of a larger organisation, instead of on their own.

A clearly visible point of contact for arriving volunteers can help formal organisations to both, distribute information and gain overview. <f-3> describes the need for a distinct point of reception to lower the entry barrier for spontaneous volunteers:

> *And then I'd go in and there'd be someone who is clearly visible as the person, I don't know, by wearing a hat or something, you know. I'd talk to him, he is my contact person now and knows what is going on. (<f-3>)*

<f-1> agrees that this could work well for small operations. However, they add that this concept would need scalability in case of major events. One person would be overwhelmed, with crowds of volunteers arriving. <f-4> states, with <f-3> affirming, that a single point of contact has been lacking during the recent crisis. Such single point of contact should also relay volunteers to their contact on site (if the contact point is not working as *liaison* outright), inform them about their insurance status, and their tasks while volunteering.

<m-1> reports that volunteers expend much effort at the beginning of the crisis; burning off most of their energy and over-exerting themselves. The problem of burn-out is especially prevalent for spontaneous volunteers as emergency organisations have no appropriate tools in place to oversee spontaneous volunteers on site. <f-1> speaks of 'helper syndrome':

> *Volunteers are in a grey area; they are allowed [legally] to work as long as they want. We had volunteers who were-- helper syndrome, they were there for 24 hours. Or longer. And they believe they must save the world and they are the only ones that can help. And you have to protect them from themselves. That is our task as organisation. (<f-1>)*

Apart from the aspect of over-extension, representatives of emergency organisations also ask for some procedure to debrief volunteers. A debriefing must include an offer for post-service support, or as <f-3> puts it: 'somewhere they can go if they suddenly aren't able to sleep anymore. You know, because 24 hours [working] in an emergency shelter? Hats off to them'. <f-2> states that, while they provided support for their equivalent of permanent disaster volunteers, they failed at reaching out to spontaneous volunteers:

> *We did not manage that so well. To reach [spontaneous volunteers] and tell them: 'listen, if you go home now and find that things are affecting you, longer and more frequently – we appreciate that you were here and helped us, but we can help you too!' (<f-2>)*

<f-1, f-2, f-3, f-4> agree that support structures must also include ways for volunteers to reflect on their experience and give feedback to the formal organisation.

> *<f-3>: It becomes easier for the people if they have the option to provide feedback.*
> *<f-1>: And the people want to talk about it. They are glad if they can talk about it. [...]*
> *<f-2>: One can clearly see that now, when the focus lies on humanitarian help [...], that people are much more affected emotionally and on the whole. [...] Now, on this matter,*

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[3] This is difficult to translate unambiguously. The original statement was, '*Weil denen muss ich Sinnstrukturen geben*'. The term 'Sinn' in 'Sinnstrukturen' can indicate both 'sense' and 'meaning', to be interpreted as 'sense of belonging' or as 'contribution with meaning'.

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> *people write to us all the time, ceaselessly, page after page.*

Feedback can also be used by the formal organisation to draw an adequate picture of the situation for themselves and the public (*<f-1, f-3>*).

INTERPRETATION OF RESULTS AND IMPLICATIONS FOR TECHNOLOGICAL SUPPORT

Regarding *RQ1* (the perception of volunteer efforts by formal organisations), we encountered a generally positive stance on the side of formal organisations. Formal organisations tried to receive and integrate individual spontaneous volunteers, rather than attempt to suppress spontaneous contribution. With regards to *RQ2* (measures put in place to integrate spontaneous volunteers), we identified a need for rapid registration processes. The overhead of sign-up procedures and the timeframe between registration and volunteer activity are reduced; by providing reception (sign-up) on site and facilitating quick contribution. Even though measures for pre-registration had been put into place several years prior to the event, impact on preventing spontaneous contribution seems limited. Regarding *RQ3* (the obstacles encountered in the integration of spontaneous volunteers) we see challenges in the unpredictable influx of volunteers. These challenges are in part organisational, and in part technological of nature: in the organisational part, there is a lack of scalability in command structures and a need to adopt appropriate leadership styles. In the technological part, paper-based registration does not scale well over time or with an increasing amount of arriving volunteers. We discuss the implications of *RQ3* in the following section.

Implications for Command and Control Studies

While successful pre-registration programmes for volunteering are in place in Austria, the extent of self-determined contribution during the migration crisis is unprecedented in recent memory. We surmise that pre-registration programmes do not preclude a large amount of spontaneous volunteers. This assumption is based on the formation of large, self-organised volunteer groups, as described in literature (Kornberger et al. 2017; Simsa 2017; Zettl et al. 2017) and documented by high media coverage. Therefore, we propose a complementary *modus operandi*. The chain of dynamics (III) → (V) → (VI) implicates an evolving approach to spontaneous volunteering. The spontaneous nature of contributions and decreased identification of volunteers with formal organisations (III) have necessitated that the formal response system adapt to accommodate it by providing fast registration processes (V). This points towards a more fleeting form of affiliation, eventually leading to what we have named *opportunistic affiliation* (VI). Using opportunistic affiliation, citizens sign up on the spot (*ad hoc*) to conduct spontaneous participation through mature structures provided by formal organisations. Opportunistic volunteers often are (initially) indifferent to an organisation's identity and do not necessarily plan to become socialised within the organisation, or join it formally. Later, they potentially shift their affiliation to another organisation, to contribute towards a different project or perceived need.

Supporting opportunistic affiliation poses an organisational challenge to command and control structures. Two organisational changes appear crucial. First, a change to the prevailing traditional meaning of 'volunteer'; where they are affiliated with, and part of, a formal organisation (Whittaker et al., 2015). In the traditional understanding, a volunteer always exists, epistemologically, as part of *one* organisation; put differently, the system in which the volunteer exists is limited to one formal organisation. If volunteers affiliate with a different organisation, they become a different volunteer – their experience, capacity and skills not proven in the new system, thus facing a 'legitimacy hurdle' (Barsky et al., 2007). To support opportunistic affiliation, it is necessary to understand the volunteer as an entity that exists independent of any formal organisation. Second, command and control structures require surge capacity to manage the unpredictable influx of opportunistic affiliates. We hypothesise that pre-registered, trusted volunteers can be trained *a priori* for leadership positions in expanding command structures, as suggested by *<f-1>*. In this scenario, pre-registered volunteers would be deployed not only to support the relief efforts through direct contribution; but also to cope with the influx of spontaneous volunteers. Further operational requirements to support opportunistic affiliation are: visibly indicating participation options, offering a single, well-marked point of reception on-site, fast registration processes and support structures to prevent overworking.

Based on the organisational implications of opportunistic affiliation and the technological challenges in volunteer reception, we propose two applications for computational support that can help to the integrate spontaneous volunteers: 1) verification and long-term storage of digital volunteer data and 2) selective digitalisation of reception and registration processes to provide scalability.

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Digital Verification of Experience (Figure 1, A)

Cone *et al.* (2003) have previously stated that 'without a means of real-time validation, [unknown individuals] are irrelevant to an incident commander' while Barsky *et al.* (2007) described how volunteers can become 'side-lined' because their capacity, background, and knowledge are difficult to verify. Quick and reliable verification of a volunteer's background and previous interactions with the formal response system could help to identify volunteers to fill gaps – or determine who is granted access to the incident area at all.

One technological implementation of this could be achieved through a distributed, permissioned ledger system, consisting of a complete list of a volunteer's previous experiences and activities in CDM. Whenever a volunteer participates in CDM, the formal response organisation adds the participation to the ledger (transaction). The transaction is verified by the organisation that enters it. Metadata can enhance transactions detailing the skills shown or gained of the volunteer. Finally, a body of formal response organisations (forming a trusted consortium) participating in the distributed ledger verifies every transaction. Therefore, any identification that is linked to transactions in the ledger enables a volunteer to immediately present a certified history of prior involvement with the consortium. To ensure privacy, read access needs to be restricted to the consortium and trusted individuals (e.g., the volunteer that is concerned by transactions). The concept of a distributed ledger implicates a persistent digital persona for volunteers, which we will discuss in the next section.

Persistent Digital Persona and Reception (Figure 1, B)

Computer supported registration processes can provide the scaling required when coping with opportunistic affiliation. While dedicated areas for registering, briefing, verifying, and tasking arriving volunteers have been proposed (Sauer et al., 2014), a digital counterpart has not been established (Waldman & Kaminska, 2015). We will discuss computational support by means of a three-stage process:

1) Registration: While digitalising the management of pre-registered volunteers has been addressed by researchers (Auferbauer et al., 2015, 2016), the registration of volunteers is still primarily done by pen and paper.

> *Now, [the registration protocol] is simply a sheet of paper. And the people at the other shelters, they don't know if this sheet has been submitted already or not. This is very important, so that [the volunteer] has insurance. We managed to make people internalise this: if there is uncertainty, fill out the form again. We can always discard it later. (<f-1>)*

Pen and paper are obtainable under most conditions and highly reliable. However, their scalability and sustainability are limited. Participants themselves suggested that this could be solved by *a priori*, digital registration 'as a self-service' (e.g., a smartphone application) while a volunteer is still on their way to the site (*<f-1>*). As part of the self-service registration process, volunteers should be linked to their contact on site (*<f-1, f-3>*). The last step, even in a digitalised registration process, has to be a personal check-in to brief the volunteer and not completely devoid this process of human interaction (*<f-3>*). From a process-oriented, technological perspective, this would be the step where a unique identifier is created and verified for the volunteer, based on the data they have entered digitally. This unique identifier is a prerequisite for the stage 2.

2) Digital Persona: if a digitalised registration process is implemented, a persistent digital persona for volunteers can be generated. There are two options for introducing a digital persona. The first option is to let the entirety of a volunteer's previous participation, as registered in a distributed ledger system, constitute the persona. The second option decouples a volunteer's personal data from their activity and implements a locally stored 'volunteer passport'. This way, each volunteer stores their profile locally on their own smartphone. Such a local volunteer profile is created during registration and is verified and digitally signed by the registering organisation.

3) Check-in / Check-out: Cone *et al.* (2003) pointed out that spontaneous volunteers are not part of any formal accountability system. This makes it difficult for official response organisations to contact them or track their presence. Such accountability would be necessary to prevent overworking (*<f-1, f-3>*), for debriefing (*<f-3, f-4>*) or for support requests (*<f-2, f-3>*).

> *It is not certain that in all cases that [volunteers] will come out of the shelters again [on their own]. Because they could get into a situation where I, representing an organisation, need to know: did they leave at all? (<f-3>)*

A computer supported, digitised check-in and check-out point can be supplied for volunteers that already have a digital persona. To find suitable locations that serve as such checkpoints will require further research. Technologically, there are multiple options for digitalised check-in and check-out points: near field

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communication (NFC), radio frequency identification (RFID) or Bluetooth appear viable for fast data transmission between mobile devices and situated checkpoint terminals.

DISCUSSION

This paper presents a systematic description of the mutual effects between spontaneous volunteering and the formal response system's endeavour to accommodate it. Building on top of this description, we identified areas for improvement and gave indication for technical backing and assistance. There are two aspects about (technological) support for opportunistic affiliation that we will discuss in detail.

Privacy and Human Factors in Digitalisation

Throughout our research project, participants – emergency organisations and mediating agencies – emphasised the importance of human interaction. All participants highlighted human beings over web portals or information kiosks or billboards, when referring to contact points or volunteer receptions. Thus, even though we propose technological support, we would stress the importance of face to face interaction.

Creating persistent volunteer personae entails transparency that can both: foster trust and harm personal privacy. Volunteers must, at all times, have sovereignty over their data, the procession thereof must be transparent and data procession must not happen without explicit permission. However, even data that is shared willingly has implications when recording a volunteer's activity. If a volunteer's data becomes public (as the result of a data breach, policy change, etc.), it can have unintended societal effects. Volunteers may experience negative backlash, as during the migration crisis, or receive retro-active benefits for their past volunteer activity. Especially the latter can encourage misuse of the system, e.g., tempering with digital profiles.

Temporal Event Progression and Relation to Emergent Groups

Figure 1 shows a model of the interactions between formal response organisations and spontaneous volunteers during the response phase of an event. However, these interactions are embedded in larger temporal and organisational context. Figure 2 depicts said context. Elements related to opportunistic affiliation are represented by shaded elements.
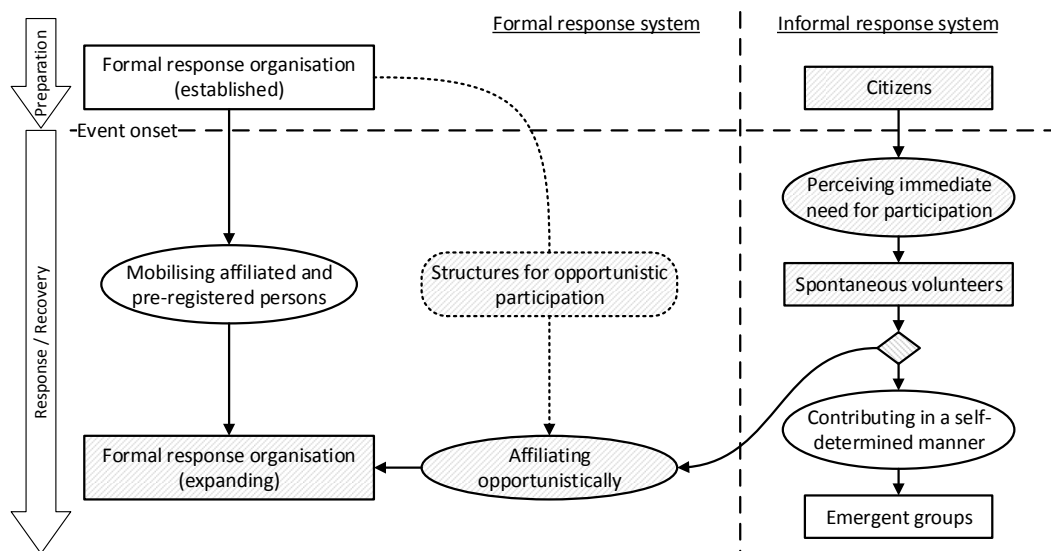

Figure 2. Temporal and organisational context of spontaneous volunteering and opportunistic affiliation

As depicted by the right-hand side path of Figure 2, citizens that do not become affiliated (opportunistically or otherwise) may participate through their own devices in an informal response system. When unaffiliated citizens collectively address perceived shortcomings in response efforts, if demands for relief are not met or existing structures are insufficient, self-organisation will result in *emergent groups* (Drabek & McEntire, 2003; Quarantelli, 1994). Emergent groups do not exist before a disaster and form new structures *ad hoc* in the power vacuum that may occur in the event's immediate aftermath (Lowe & Fothergill, 2003; Simsa et al., 2018). Research on emergent groups in the context of the migration crisis has been carried out by others. Simsa et al. (2018) link the formation of emergent groups to the inability to flexibly incorporate spontaneous participation in formal structures. Kornberger et al. (2017) point to the attractive opportunities for participation that emergent

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groups offer spontaneous volunteers. Through their highly flexible structures, emergent groups present a favourable option for spontaneous volunteers, even when formal organisation have established presence. Thus, emergent groups have been proposed as intermediaries (Zettl et al., 2017) or links to spontaneous volunteers (Skar et al., 2016). Our work suggests that emergent groups are bolstered by spontaneous volunteers who have acted neither on offers for pre-registration, nor options of opportunistic affiliation (assuming these exist). Thus, we currently see two potential approaches for command and control to address spontaneous volunteers and emergent groups:

1) Offer forms of participation that are equally attractive as those of emergent groups. In this paper, we discussed opportunistic affiliation for that very purpose.

2) Accept emergence of self-organised groups and utilise their maturing structures as buffer between formal response and convergent, spontaneous volunteers.

CONCLUSION

Volunteers are an important part in crisis and disaster management, as they can provide surge capacity, but also flexibility and creativity. However, volunteers become more self-determined and spontaneous in their decisions to contribute, shifting away from long-term affiliation and detaching from formal response organisations. This autonomous and spontaneous behaviour poses a challenge for command and control structures: to integrate the activity of such spontaneous volunteers into traditional methods and procedures. Doing so is necessary, not only to utilise the capacity of spontaneous volunteers, but also to mitigate disruption of formal response efforts and prevent loss of health.

In this paper, we give a systematic description and analysis of the dynamics that emerged between spontaneous volunteers and formal organisations during the migration crisis affecting Europe in 2015. The increasingly short-term forms of volunteering lead formal organisations to accommodate spontaneous volunteers, especially through the adaption of registration procedures. The extrapolation of this trend leads to opportunistic affiliation, where structures of formal organisation are used for short-term volunteer participation, on the spot. This requires a high degree of flexibility that information technology can help to provide. We show how digitalisation of volunteer reception and a digital, secure, distributed information storage can be used to achieve both: better scaling of spontaneous volunteer management, and building trust. Implementing such a system facilitates opportunistic affiliation, one possible approach to spontaneous volunteer management.

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