Integrating citizen initiatives in a technological platform for collaborative crisis management

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ABSTRACT

Although they can make a significant contribution to crisis response and management, citizens tend to be underestimated and under-integrated by official crisis responders. There is a necessity to take citizen contribution into crisis management tools, both for the information they can provide (*information-focused volunteers*) and the actions they can carry out (*action-focused volunteers*). Therefore, professionals need to be aware of the diverse ways citizens can help them to manage a critical situation: obviously by improving the situational awareness, but also by spontaneously performing tasks to meet specific needs on the ground.

After presenting the RIO-Suite software, a crisis management tool based on collaboration of stakeholders, this paper suggests ideas about how to make the most of action-focused volunteers to improve the orchestration of the crisis response. Given a volunteer action, four possible decision types are identified: Ignore, Stop, Consider and Support, and their consequences on 1) the crisis response and 2) the collaboration process are presented.

Keywords

Citizens, Volunteers, Integration, IT Solution

INTRODUCTION

Information and Communication Technologies (ICT) and social media drastically changed the way information is shared and structured in times of crisis (Alexander 2014). Thanks to these powerful tools that give them a voice, citizens are becoming more and more influent in crisis situations. Their participation is fostered, and the concept of volunteerism in crisis situations is broadened, to include emergent unaffiliated citizen initiatives (Stallings and Quarantelli 1985; Whittaker et al. 2015). More than simple information sources, they sometimes act directly on the ground, or use social media as their own crisis management tools (to organize the response, exchange information, communicate about their actions…). Sometimes formally organized as official helping groups, sometimes acting independently, spontaneously and with unpredictable skill levels, citizens play heterogeneous roles, and the volunteer behaviors are many and varied.

With such a diversity of new unconventional actors to take into account, some important challenges are rising up. Among them, the question about the collaboration between official crisis managers and citizens. Indeed, among the profusion of volunteer types in crisis situations, some emergent groups tend to be more difficult to understand and to manage than traditional crisis management stakeholders. Official crisis responders must be aware that unsolicited volunteers will always show up during crisis events (der Heide 2003). Thus, there is a definite need to

integrate social media data and volunteer initiatives in crisis management tools to improve the situational awareness and take more appropriate account of citizens' help (Vieweg et al. 2010; Yin et al. 2015).

Considering cooperation and communication of stakeholders as keys to crisis management efficiency, RIO-Suite is a suite of tools that aims to provide decision makers with a visual model of situation and a computable collaboration process model to orchestrate the crisis response. However, in its current stage of development, the only stakeholders taken into account by the software are official crisis responders. Thus, given the diversity of contributions that citizens can bring to the crisis response, the software development is now focused on broadening its scope to less formal stakeholders, aiming to be able to make the most of volunteer initiatives, and thus to support a collaborative answer to the crisis.

After studying the current status of citizens in crisis management, this paper will present the software RIO-Suite, which aims at integrating citizen initiatives into the situational awareness and the crisis response processes. Then, it will present the early stages of thinking regarding the integration of volunteer initiatives into the software. For the research presented in this paper, it is important to keep in mind that the goal is not to change the way citizens react to a crisis, but to help decision makers to understand volunteers' behavior on the ground, and be able to take decisions regarding how this behavior could improve the response.

LITERATURE REVIEW

Citizen consideration in crisis situations

About cooperation between professionals and citizens, Reuter et al.'s communication matrix for a social software infrastructure (2011) presents the current communication paths between official crisis response organizations and ordinary citizens (see Table 1). In some ways, professionals go no further than just picking information from social media (case (a)), and providing information or safety instructions to citizens (case (b)) through these tools.

Table 1. Reuter et al.'s (2011) communication matrix for a social software infrastructure

Sender \ Receiver	Organizations	Citizen
Organization	(d) Inter-organizational crisis management	(b) Citizen communication
Citizen	(a) Integration, aggregation and validation of citizen-generated content	(c) Self-help communities

As this matrix is focused on communication, it does not give a comprehensive point of view on the current cooperation considerations between professionals and citizens. In general, official crisis responders have preconceived ideas regarding citizen behavior. In a disaster, when by definition the resources and capacities of official crisis responders are insufficient to handle the needs, professionals tend to treat citizens as an unwanted nuisance (Glass 2001). They often establish a physical and psychological perimeter around the event, to keep the public out. This is what Glass (2001) calls the "yellow-tape" effect.

However, many research works regarding volunteers' role in times of crisis have shown that citizens can be much more than just senders and receivers of information (Glass 2001; Scanlon et al. 2014; Wenger et al. 1985). Although it is believed that the typical reaction of an ordinary citizen to a crisis situation is shock, panic, stress and disorganization, several social science studies have demonstrated that these responses do not represent the reaction of the majority of disaster victims (Perry and Lindell 2003). Several examples of crisis situations show how citizen groups can organize themselves in times of crisis, whether it is on the ground (Scanlon et al. 2014) or online (Eriksson and Olsson 2016). Thus, being aware of all these citizen initiatives to improve the situational awareness and the crisis response remains an important challenge that professionals have to cope with (Scanlon et al. 2014).

Citizen contribution in crisis response

The positive value of citizen organization and crowdsourcing

Several studies show how social media can be a powerful tool for communities to build disaster resilience (Dufty 2012; Rizza and Pereira 2014). Sometimes used as an alternative communication channel to improve the information responders have regarding the situation (Vieweg et al. 2014), sometimes used as a backchannel when

traditional communication channels are out of service (Sutton et al. 2008), sometimes used by citizens to provide psychological first aid, or foster solidarity and ethics of care (Rizza and Pereira 2014; Taylor et al. 2012)... Citizens appropriate social media in many ways to meet their needs. A variety of examples in the literature and related to several crisis contexts describe the many ways ICT in general have been used, and sometimes taken into account by professionals. To name a few, we can talk about the Facebook groups created and used by citizens to share and structure information regarding victims after the 2011 Genoa floods (Rizza and Pereira 2014), or the significant impact of crowdsourcing (Horita et al. 2013; Meier 2013) such as the 2.3 million people using the Tomnod[1] website to find the Malaysian Airlines flight MH370 (Fishwick 2014).

Even outside of social media, several examples show the organization that citizens can demonstrate on the ground, when they are faced to a crisis situation. Indeed, unlike what is shown in "disaster" movies, novels and press coverage, most citizens respond constructively and rationally to the crisis by addressing their needs with the most effective mobilization of the resources in their possession (Perry and Lindell 2003). Several examples of such behavior are given by Scanlon et al. (2014), highlighting how ordinary people can play a relevant and important role in disaster response.

Still some challenges to cope with

Although the contribution of citizens in crisis situations is convincing, challenges remain, particularly through the integration of social media into crisis management processes. According to extensive research on the subject, social media integration rises challenges both on technical and social aspects (Crawford and Finn 2015).

On the one hand, we can cite the data volume, quality, trust and format challenges, that need powerful algorithms to extract relevant data from a diversity of sources (Alexander 2014). To quote Goolsby (2009), one might say that finding useful information during a major event is "a little like panning for gold in a raging river".

On the other hand, beyond digital divide and access to information issues (Easton 2014), social media use to manage a crisis can lead to rumor propagation, panic or rise several ethical challenges, such as privacy or governance concerns (Rizza et al. 2014; Watson and Finn 2013).

Attempts to integrate citizens

From information gathering to crowd tasking: a variety of tools to benefit from citizen contribution

Several research projects have already taken the first steps towards the integration of citizens into the crisis response. Regarding social media data, a multitude of research projects are focused on gathering, filtering, analyzing, and interpreting data from social media to improve the situational awareness. Among them, we can present Aupetit and Imran's tool (2017) to help official crisis responders to monitor social media data and find critical information regarding the situation. Working closely with an American 9-1-1 call center, Grace et al. (2019) compare several social media data filtering methods to improve the situational awareness in local areas for emergency managers.

Outside of social media, several tools also tend to help crisis management organizations to get closer to the citizens and take advantage of their potential help. For example, the ISAR+ European research project[2] aims to make the most of ICT by developing a platform to empower citizens and Public Protection and Disaster Relief (PPDR) organizations in online and mobile communications (Flizikowski et al. 2014). For example, Auferbauer et al. (2015) present RE-ACTA, a tool under development which aims to selectively distribute tasks to a crowd of volunteers, resulting in a specified form of crowdsourcing: *crowd tasking*. However, although crowd tasking could be relevant for a certain type of volunteers wanting to play their part in the crisis management, some spontaneous unaffiliated forms of volunteerism will always remain independent, and for such types, attempts to command and control their tasks may be misguided and counterproductive (Whittaker et al. 2015).

Among the already deployed IT solutions to make the most of citizen contribution in times of crisis, several applications tend to register volunteers to be able to task them when needed. For example, *PulsePoint*[3] or *Staying Alive*[4] are two mobile applications aiming to alert the closest CPR-trained citizens and localize the closest Automated External Defibrillator (AED) in case of cardiac arrest emergencies. In a broader scope, the Facebook Safety Check aims to help people to declare themselves safe, provide local assistance or connect to providers in

[1] https://www.tomnod.com/
[2] https://www.zanasi-alessandro.eu/projects/isar/
[3] https://www.pulsepoint.org/
[4] https://www.stayingalive.org/

case of emergency or disaster. In a more indirect way, crowdsourcing-based tools such as Waze[5] can also help professionals to get information or modify the road traffic in a crisis situation, and thus benefit from the crowd contribution to improve the crowd geographic distribution.

The potential of Intermediary Organizations

Following the idea that collaboration from the officials' perspective is hampered by a lack of an intermediary person to create a link between emergent groups and public authorities (Stallings and Quarantelli 1985), Zettl et al. (2017) defend the need of *intermediary organizations* to bridge the coordination gap. After presenting a long list of research projects which aim to fill this gap, they present two tools to support this concept of intermediary organizations: City-share, a situated public display application, and Security Arena, an inter-organizational platform. The purpose of these two crowd-based tools is to foster collaborative resilience between professionals, organizations and emergent volunteers.

The objectives of such tools are in line with the current status of the Volontaires Internationaux en Soutien Opérationnel Virtuel (VISOV) association, the French-speaking equivalent of the Virtual Operational Support Teams (VOST). Indeed, the VISOV association has signed agreements with official crisis management institutions in France, and its volunteers act as an intermediary link between citizens sharing information through social media, and official crisis responders. When a crisis occurs, the VISOV are 'activated', and they use collaborative tools to filter and share useful social media information to professionals.

Moreover, even in less formal contexts, many crises have seen the emergence of organized groups of citizens who remain in place after the events, building organizational networks and strengthening community resilience. For example, we can think about the Facebook group "Angeli col fango sulle magliette" in Genoa (Rizza and Pereira 2014), or the networks *Second Planet* in Frankfurt and *Train of Hope* in Vienna (Zettl et al. 2017), all of them created to address specific needs during a crisis, and remaining several years after to keep sharing crisis-related information.

Professionals and citizens: a need to cooperate

Organizations in charge of emergency management need to realize that involving citizens does not interfere in their protocols by making them less efficient (Díaz et al. 2013). Actually, according to Benaben et al. (2016), collaboration and coordination of stakeholders are key requirements of crisis management. Thus, by improving their cooperation, professionals and citizens could both be aware of others' needs, and thus contribute together in a more effective way to (i) improve the situational awareness and (ii) organize the crisis response.

However, to date, there is a lack of frameworks to create a comprehensive and manageable process to ensure the most effective and safe response with the aid of spontaneous volunteers (Orloff 2011). Thus, more adaptive and inclusive models of emergency and disaster management must be developed to integrate these volunteers into the response and harness the capacities and resilience that exist within and across communities (der Heide 2003; Whittaker et al. 2015).

RIO-Suite, a suite of crisis management tools based on collaboration between stakeholders

To provide professionals with the best possible understanding of the situation all along the crisis response, and to orchestrate the tasks carried out by stakeholders in real time, researchers at IMT Mines Albi's Industrial Engineering Centre developed the RIO-Suite platform. This platform is based on a *metamodel* (i.e. a set of generic concepts and their relations) for knowledge management in crisis management, presented by Benaben et al. (2016). Thanks to a diversity of data sources, such as sensors, official crisis management procedures, or social media, the RIO-Suite software aims to *instantiate* (i.e. identify) concepts of the metamodel in the crisis situation. In other words, the goal for the software is to provide the most comprehensive digital representation of the situation on the ground, to then be able to deduce the most appropriate collaborative behavior schema and then orchestrate it as the crisis response.

[5] https://www.waze.com

This metamodel (see Figure 1) consists of a *Core* part, representing the concepts presents in any collaborative situation, and four packages that are an extension of the core concepts, dedicated to crisis management situations:

- **The Partners** (left part): these concepts represent the stakeholders, their capacities and their resources, that might be needed during the crisis response.
    - E.g.: A firefighter (*actor*) has the ability to extinguish a fire (*service*) with a fire hose (*resource*).
- **The Context** (top part): these concepts are all the stakes and contextual elements that can take part in the crisis situation.
    - E.g.: A museum (*good*), the visitors inside it (*people*) or a regional nature reserve (*natural site*) might be affected (damaged or injured) by an intrinsic risk of flooding (*risk*) if they are present in an area liable to flooding (*danger*).
- **The Objectives** (right part): Whereas given a geographical area we might be able to know the *Partners* and *Context* concepts, the *Objectives* are concepts given by the crisis itself. These concepts represent all the elements that define the crisis and can have an effect on the events.
    - E.g.: A starting fire (*fact*) and a fragilized building (*emerging risk*) must be considered as objectives (*mission*). Besides, the wind or the rain will change the seriousness of the fire (*gravity factor*) while a bad social climate may change the nature of the crisis (*complexity factor*).
- **The Behavior** (bottom part): This package is slightly different from the three previous ones. It defines the rules to orchestrate the collaboration in the crisis management processes. This package is inspired by the Business Process Model and Notation (BPMN) standard for process modeling.
    - E.g.: The orchestration process (*collaborative process*) can be composed of a list of actions (*task*) carried out by organizations (*partner pool/lane*), arranged in a specific order (*sequence flow*), and assisted by the flow of information (*message flow*).

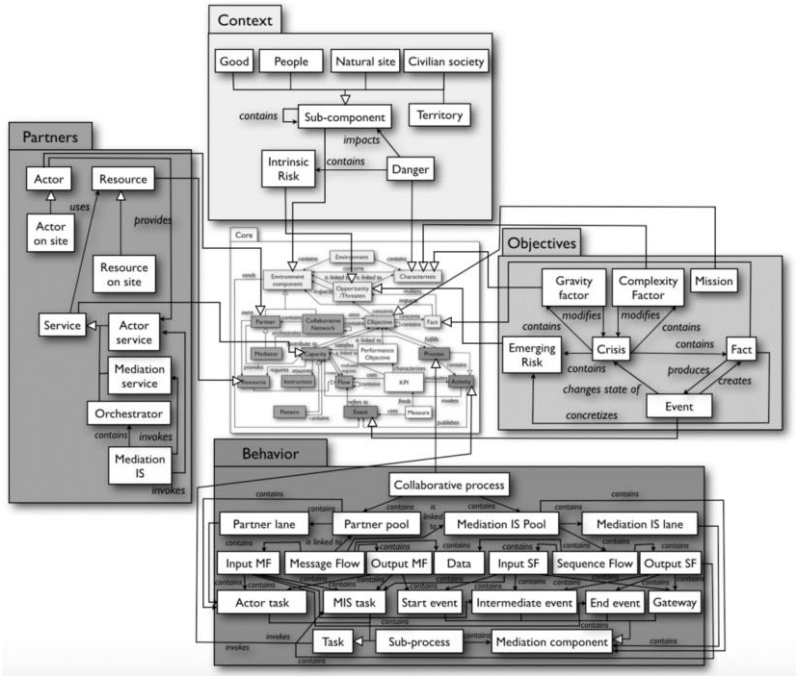

Figure 1. The RIO-Suite metamodel for knowledge management in crisis management (from Benaben et al. (2016))

Given all these inputs, the software is currently able to provide two outputs:

- A **Situational Model** with 1) a map of the stakeholders and the capabilities that they may need to mobilize, and 2) a cartographic vision of the issues at stake;
- A **Collaboration Process** to orchestrate the crisis, i.e. give advice to crisis managers regarding who should do what, at what time.

An overview of the input and output elements of the software are presented in Figure 2. To date, this model keeps being improved, so that it can be used for specific cases of crises, and to be sure it can embrace all types of collaborations in crisis management.

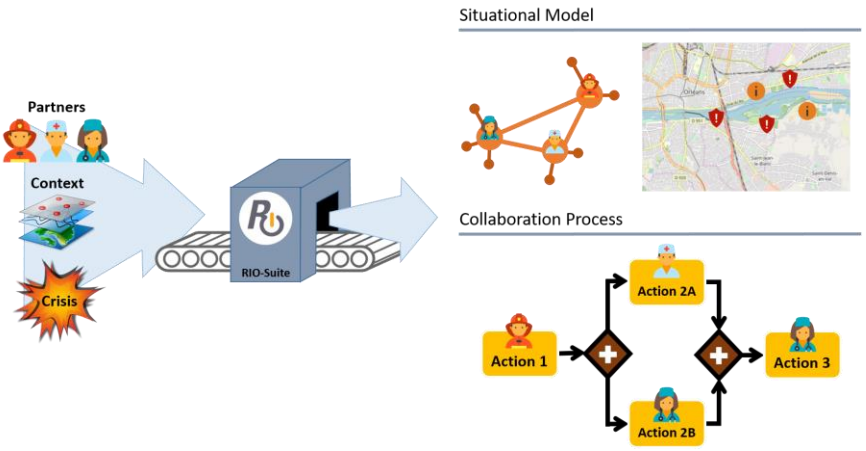

Figure 2. The current input data and output models of RIO-Suite

In the current state of development of the software, only official crisis responders, their skills and resources are taken into account as "Partners". To meet the definite need to integrate citizen initiatives into crisis management tools, the research is now focused on the volunteers, and seeks to make the most of their contribution.

PROPOSAL – INTEGRATING INITIATIVES TO SUPPORT CITIZEN-PROFESSIONAL COLLABORATION

Making the most of citizens' contribution: improve situational awareness and understand action

To capitalize on citizens' contribution in a crisis situation, the first need is to identify this contribution. In the literature, a large amount of research has been done to classify and categorize volunteers in crisis situations, but most of them were focused on the social structure of such initiatives. Distinguished between *Old* and *New structure* by Dynes (1970), *Individual* and *Organized* by Shaskolsky (1965), *Emergent* and *Organizational* by Wolensky (1979), *Formal* and *Informal* by Cnaan et al. (1996) and Whittaker et al. (2015), this social structure in which the volunteer initiative takes place tends to define its level of formalization, or its reliability from the officials' point of view.

Another strong distinction that appeared more recently between forms of volunteerism is related to the emergence of new initiatives fostered by the advent of ICT and social media in our society. Called *digital volunteers* by Whittaker et al. (2015), *virtual volunteers* by Reuter et al. (2013) as opposed to *real volunteers*, these emerging groups are identified by the communication channels they use rather than the initiatives they take.

However, among the diversity of citizen initiatives, from a group of people moving rubble in search of victims and an individual volunteer sharing a picture on Twitter, an important distinction that appears is that they don't provide all the same elements to the crisis response. While some volunteers perform or manage actions on the ground intending to help crisis responders or address personal needs, other ones share or organize information about the unfolding crisis, that might improve the situational awareness. In other words, when some volunteers are focused on the action, those focused on information help crisis responders to understand the first ones.

Thus, when looking at the RIO-Suite outputs, two ways of taking into account the citizen contribution appear:

- The *information-focused volunteers* will contribute to the situational model, by helping to instantiate new concepts of the metamodel. Thanks to the many information channels they use, from traditional ones to social media or other ICT, understanding the information shared by citizens can help to find new stakes, to identify a risk, or give insights on the progress of the crisis. This is in line with a profusion of work on the subject of social media data processing (Grace et al. 2019; Vieweg et al. 2010; Yin et al. 2015).
- The *action-focused volunteers* will contribute to the collaboration process, by carrying out actions thanks to their skills and their resources. Whether in a constructive or destructive way, these citizen initiatives will tend to change the situation on the ground, and might be detected by the *information-focused volunteers* or other stakeholders or tools (Ludwig et al. 2017; Neubauer et al. 2013).

By setting aside the method of identifying these *action-focused volunteers*, the next steps in this article will aim to discuss decision types regarding their potential integration into the crisis response process.

Towards integration of action-focused volunteers

From this objective, we can identify two main areas of research, that will be detailed below:

- What status should a volunteer initiative take?
- How to update the collaboration process with an identified initiative?

Status of the volunteer initiative: parameters influencing decision-making

Given a group of people moving rubble to find victims after an earthquake, what parameters can make the decision-makers change from wanting to stop them doing this action to wanting to provide them tools to improve their efficiency? Such a decision might rely on a list of implicit or explicit parameters. Here are some possible elements of influence on the decision:

- The **reliability** of the initiative can be a deterministic element for the decision making. This element includes the criteria of affiliation and skill level, which can be closely linked to each other in some cases. Indeed, it will be easier for professionals to cooperate with a volunteer registered with an official organization such as a volunteer firefighter whose skills are known, than cooperating with spontaneous unaffiliated volunteers with uncertain skills;
- The **ethical and social aspects** that integrating a volunteer initiative might represent, and the risk that this integration might represent for the volunteer him/herself;
- The **variety and volume of the needs to address**: depending on the size of the crisis and its intrinsic characteristics, professionals might estimate that they have enough resources to address all the needs or not;
- The **professionals' competences and resources**: whereas the former parameter defines the needs created by the events, the diversity and number of official responders and the scope of their skills will define their control of the situation;
- The **professionals' attraction and experience** with the use of social media and their openness to citizen contribution.

Such parameters might be deterministic for professionals to decide whether an initiative should be taken into account, ignored or stopped to improve the response. Moreover, all along the crisis response, the unfolding events might change the implicit value of these parameters, and consequently change the way professionals perceive a volunteer initiative.

Update the collaboration process from citizen action

Secondly, how can a citizen action influence the crisis management process? Indeed, as the software creates a process model describing collaborative behavior to respond to the crisis, if the goal is to have an agile management of this process, everything that happens during the crisis should be taken into account. In such a context, with the means and skills in their possession, citizen contribution for the response can be constructive, neutral or even destructive. For example, we can imagine that citizens can either start by themselves to fulfill a task that was assigned to other partners, or act in the opposite way and unintentionally create new tasks that will need to be accomplished by other partners. In both cases, crisis managers need to understand the way citizens behave, to be able to instantiate a new task or a new sub-process, or change the way tasks are assigned to stakeholders.

An overview of the prospective improvements that citizen integration can bring to RIO-Suite and its outputs is presented in Figure 3. Volunteers, whether they are known in advance or not, can be considered as additional partners. Thus, knowing their skills, resources and tasks in progress could improve the common operational picture (i.e. situational model) and update the collaboration process in several ways.

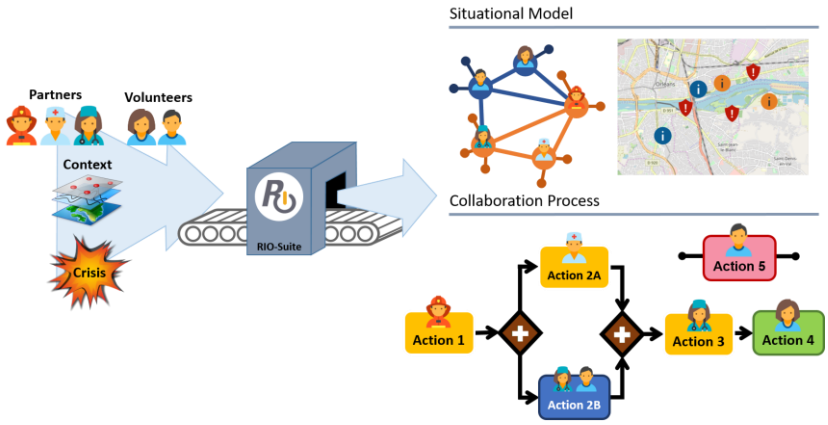

Figure 3. The target situation after taking into consideration the citizen initiatives into RIO-Suite

Different types of decision and their respective consequences

Given the different parameters that can influence the decision making regarding a citizen initiative, four types of decision have been identified, listed below with examples of crises during which such decisions were taken or should have been taken:

- Ignore
  - E.g.: During the 2015 migrant crisis in Europe, hundreds of refugees arrived daily by train at German and Austrian train stations. Spontaneous groups of volunteers mobilized to provide relief to refugees. Suffering from a lack of clear political directives, humanitarian organizations were bypassed by citizens, resulting in a chaotic situation and pointing out the lack of institutionalized cooperation (Zettl et al. 2017).
- Stop
  - E.g.: Following the 1999 Golcuk earthquake in Turkey, a traffic jam of 32 kilometers of spontaneous aid volunteers blocked professional aid workers and rescue vehicles to get to the disaster location (Helsloot and Ruitenberg 2004). Identifying and finding ways to stop this mass movement could have helped to save lifes.
- Consider
  - As it will be explained later, the fact of *considering* a citizen initiative will not have any consequence on the crisis response on the ground, but it will result in incorporating the initiative process into the global collaboration process. In other words, *ignoring* and *considering* a citizen action will both have no impact on the ground.
- Support
  - E.g.: Soon after the Swissair 111 crash into the Atlantic Ocean in 1998, fishermen near the crash location immediately headed out to sea to search for survivors. Upon arrival at the accident site, the Royal Canadian Navy ship asked them to line up and help them searching systemically the area (Scanlon et al. 2014).

These types of decision will have different consequences, both in the crisis response and on the collaboration process, as presented in Table 2.

Among these four decision types, the easiest one to put into practice will be to *ignore* the identified citizen behavior. Indeed, this means being conscious that this behavior is happening, but doing absolutely nothing regarding it, both on the ground and on the crisis management process. However, being the easiest decision to take does not mean this is the smartest one, because it may mean missing a relevant opportunity for the crisis response, as it has been the case during the migrant crisis in 2015 (Zettl et al. 2017). The fact of *considering* a citizen initiative aims at letting them act, without trying to change their action or supervise them.

Although the professionals' intention might be completely different, the difference between *stopping* and *supporting* a citizen initiative is slight. Indeed, these two decisions may result in new tasks for professionals (responders or mediators), resource mobilization, and may bring several updates to the collaboration process. Further research work needs to be done to understand citizens' motivations when acting during a crisis, to understand which impact *stopping* or *supporting* them could have on their behavior.

Table 2. The four decision types regarding citizen initiatives, and the changes it brings to the response and to the RIO-Suite collaboration process

Decision type	Potential change in the crisis response	Potential impact on the collaboration process
Ignore	None	None
Stop	• Mobilize official crisis responders, their resources and their skills • Volunteers switching to another task • Anxiety, distrust from the population • Increasing complexity of the crisis	• Adding professional tasks
Consider	None	• Adding the current volunteer tasks
Support	• Mobilize official crisis responders, their resources and their skills • Dedicate resources to the citizen action	• Adding the current volunteer tasks • Removing, Updating or Adding professional tasks

DISCUSSION AND CONCLUSION

Given the previous research on the subject, a fifth type of decision could be added: *crowd tasking*, as some tools presented in the literature review do. As this decision aims to pre-register volunteers and control citizens' behavior in the crisis response, it doesn't appear in the scope of objectives of RIO-Suite so far.

The four decision types presented in this article, and the parameters of influence on the decision-making might be closely correlated. For example, given a volunteer initiative, the gravity or complexity of the crisis might change the decision professionals will make.

Among the parameters of influence on volunteer integration, some tend to increase the relevance for professionals to do it: the reliability of the initiative, the needs generated by the crisis, and the ethical and social possibilities for integration. The remaining parameters, the professionals' competences and resources, and their attraction and experience with social media might be limiting to make an opportunity happen: the more professionals are overwhelmed, the less time they will be able to devote to the integration. These first hypotheses of correlation between the parameters and the decision types are presented in Figure 4 and will be discussed in future research work, based on case studies, interviews and observations.

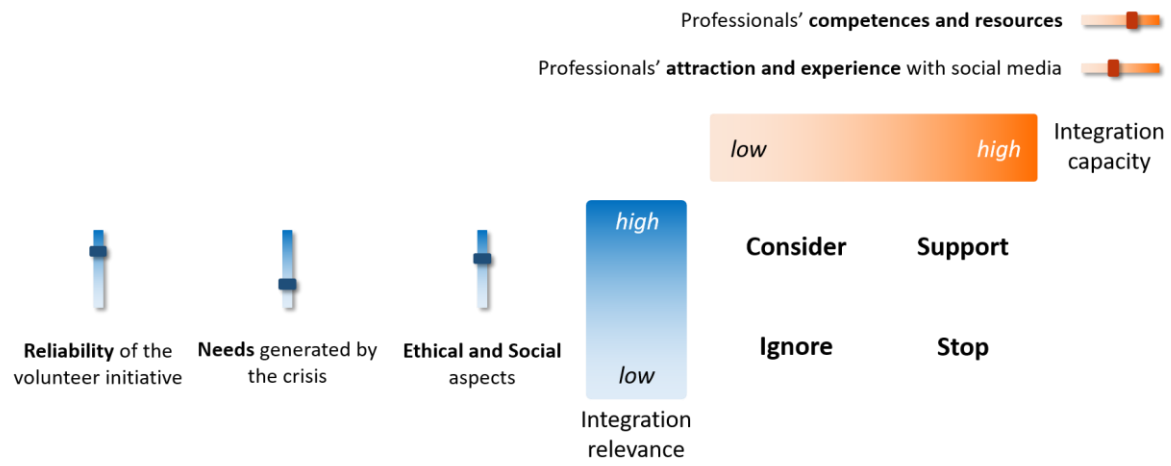

Figure 4. First attempt of framework for correlation between influence parameters and decision types

To summarize, this work in progress paper presents (i) the global parameters that can influence the crisis responders' decision making, and (ii) the four identified decision types regarding citizen initiatives. Future research work will focus on studying the correlations between (i) and (ii).

With the idea of integrating volunteers into RIO-Suite to foster multi-stakeholder collaboration, several works can be done for the future of this project:

- Test the robustness of the model by confronting it with specific case studies, interviews and observations;
- Find potential weaknesses of this model and suggest changes to make it more inclusive for all types of events;
- Propose possible additional layers to specialize it to the integration of citizens and their tools

Regarding the detection of the *action-focused volunteers*, social media are one of the few ways to detect such initiatives. Thus, when making decisions regarding volunteer integration for the crisis response, it should be kept in mind that the only volunteers that can be detected are those whose action can be shared through social media or other ICT. In addition, outside the crisis management unit, decisions taken by professionals on the ground must be taken into account in the crisis management process.

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