Review-based taxonomy of post-impact volunteerism types to improve citizen integration into crisis response

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ABSTRACT

Information and Communication Technologies (ICT), and particularly Social Media, drastically changed communication channels and organization during a crisis response. In this context, new forms of citizen initiatives appear, contributing to situational awareness, providing new profiles of stakeholders and broadening the scope of volunteerism in disaster situations. Thus, given the increasing need to understand and take citizen initiatives into account, this article provides a taxonomy of volunteerism types in crisis contexts, based on a literature review on the subject. Mapped on two main dimensions: the *status* (who they are) and the *focus* (what they are doing), multiple types of volunteers are presented on this taxonomy. Then, the article deals with possible use of this taxonomy towards integration of citizen initiatives into the crisis response.

Keywords

Review, Volunteers, Taxonomy, Social Media, Citizen Integration

INTRODUCTION – FROM UNDERSTANDING TO INTEGRATING CITIZENS INTO CRISIS MANAGEMENT PROCESSES

Recent events in France (e.g. 2016 and 2018 floods in Loiret and Aude, 2015 and 2016 terrorist attacks in Paris and Nice) have confirmed the opportunities and challenges raised by social media in crisis management. Ordinary citizens are usually the first on the scene during an emergency to take care of victims, conduct search, organize solutions on-site, and they remain long even after official services have ceased (Whittaker et al. 2015). As citizens are taking a growing place in the stage of crisis management, their voice is strengthened by social media, which has become a tool for them to communicate, organize themselves and act. Moreover, professionals see the increasing potential of social media to address as many people as possible, and to understand citizen behavior during crises. While "real volunteers" and stakeholders are on-site and fight locally against the effects of a crisis, the "virtual volunteers" are located anywhere and help stakeholders on the ground and crisis managers through social media (Reuter et al. 2013).

Volunteerism in crisis management covers a large panel of acceptations, ranging from the most restricted to the broadest. On the one hand, volunteers have been defined as people engaged in response to a request expressly made by a representative of an official organization (Blanchard 2008; Koob and Emergency Management Australia 1998), while on the other hand, we can see volunteerism as any freely chosen and deliberate action, be it spontaneous or organized, which is not necessarily formally regulated (Snyder and Omoto 2008; Wilson 2000; Wolensky 1979). Thus, it appears that between these opposed definitions, there might be a large diversity of volunteerism types, going from the most organized and affiliated to the most spontaneous and unaffiliated.

For example, following the growing place taken by social media in crisis response, some associations such as the Volunteer Operational Support Teams (VOST) and its French equivalent Volontaires Internationaux en Soutien Opérationnel Virtuel (VISOV) appeared. Progressively, they are playing an intermediary role between ordinary citizens and official crisis managers by filtering and processing social media data to help improving the situational awareness in real time. Although in France, the VISOV are becoming more and more institutionalized by signing agreements with official crisis response partners, they remain an association, and they are just an example amongst a growing number of diverse and varied citizen initiatives based on the great potential of ICT in crisis response.

To make the most of this potential help and support for crisis response, there is definitely a need for integration of social media in IT for crisis management (Mathioudakis and Koudas 2010; Vieweg et al. 2010). Moreover, it is essential for local authorities to recognize that in times of crisis, unsolicited volunteers will show up (der Heide 2003) and 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).

The research presented in this paper, conducted as part of the French National Research Agency project MACIV (Management of Citizens and Volunteers: the social media contribution in crisis situations), focuses on the diversity of citizen initiatives as they are fostered by social media in times of crisis, to understand them, and think about ways to integrate them into crisis response and management processes. In order to understand this diversity of citizen initiatives and to propose ways to integrate them into crisis response and management processes, the research is divided into two lines, which can be presented as follows:

1. Understanding the role played by citizens in times of crisis to foster organizational collaboration with official responders
2. Proposing an IT solution to orchestrate the collaboration between professionals and citizens in real-time

In this article, we will present the first research findings related to the first axis, as a requirement for the second one.

Indeed, when it comes to integrating citizens into crisis management processes (2.), the first need that rises is about understanding citizens taking part in a crisis response (1.). To answer to this question, the first step presented in this article consists in understanding who these citizens are, by creating a taxonomy of volunteerism types in crisis response and management. Then, the idea will be to describe the likelihood of the appearance of each type of volunteerism, depending on the crisis context, i.e. the disaster type, its extent, and the environment type. In this article, we argue that if we are able to categorize the citizens in times of crisis, and to give their characteristics, then we could be able to identify them when a crisis occurs. Then, we could go into further details to understand the way they are acting: what are the communication, organization and action processes that these types of volunteers put into practice to address their needs or those of the community? Given an advanced knowledge of these types of volunteers, and looking through the prism of social media, crisis responders could then be able to identify volunteer types, understand them, and take decisions regarding whether or not to integrate them into the crisis response process.

The final goal of this research would be to integrate citizen initiatives in times of crisis into a suite of tools to support collaboration in crisis management: RIO-Suite. This software, based on a generic model of collaboration, aims to instantiate every concept that can potentially take part in a crisis occurrence (environment, dangers, risks, opportunities, threats, partners, competences, resources, stakes…), to then propose an optimized plan to orchestrate the crisis response in real-time. Thus, the taxonomy of volunteer types presented in this paper will be a first step to implement the integration of citizens into RIO-Suite, but it has been created without any consideration of the software framework to remain useful for other research purposes dedicated to understand citizens engaged in crisis response.

HISTORY AND EVOLUTION OF VOLUNTEERISM IN CRISIS SITUATIONS

What does *volunteerism* mean?

Derived from the Middle French[1] word *voluntaire*, the noun *volunteer* was first used as "one who offers himself for military service" (c. 1600)[2]. Then, over time, the concept evolved beyond the military framework, to include broader forms of engagement. Described by Dynes (1970) as an "expansion of the citizenship role", volunteerism has become a vast concept with unclear boundaries.

[1] Middle French is the first form of official unified French language in the kingdom of France (14th – 17th centuries)
[2] ("volunteer | Origin and meaning of volunteer by Online Etymology Dictionary" 2019)

After reviewing several definitions, Cnaan et al. (1996) conclude that the boundaries of the term *volunteer* vary from one context to the other. They show that widely used definitions of the term range from the broadest to the purest of interpretations. According to their results, definitions vary on four key dimensions: free will, remuneration, intended beneficiaries and structure.

We can find back three of these four dimensions in the requirements of volunteerism according to the United Nations Development Programme (UNDP): "Firstly, the action should be carried out voluntarily, according to an individual's own free will, [...] Secondly, the action should not be undertaken primarily for financial reward. [...] Thirdly, the action should be for the common good. [...] The three criteria of free will, non-pecuniary motivation, and benefit to others can be applied to any action to assess whether it is volunteerism." (United Nations and EBSCOhost 2011) In this definition, the UNDP voluntarily puts aside the notion of "mandatory volunteerism" such as community service as an alternative to military duty or custodial sentences. The report also states that it doesn't consider the organizational criterion (i.e. "structure" in (Cnaan et al. 1996)) in the definition, in order to include many acts of volunteerism that take place outside of a formal context. This is in line with Whittaker et al.'s (2015) argument, who after having compared several definitions, argues that many of them "exclude those who act independently of the state or formal organisations, and obscure much of the shorter-term, informal volunteering that occurs in times of crisis." Thus, they defend the idea that "less rigid definitions of volunteerism are needed to fully recognise and value citizen contributions in the context of emergency and disaster management." (Whittaker et al. 2015)

Thus, the notion of volunteering has expanded over the years, and the field of crisis management has seen the emergence of initiatives that have pushed the boundaries of the term. In its most inclusive sense, volunteerism in crisis management can be defined as 'any willful action, be it spontaneous or organized, carried out outside the actor's working context, in which time is given to benefit another person, group or organization'.

Social Media: shifting paradigms in crisis management

Social media, and in general, Information and Communication Technologies (ICT) have drastically changed the way a crisis is managed, both on social and technical aspects. On one side, they foster inter-organizational communication, and give a voice to citizens. On the other side, they provide powerful tools for crisis responders to improve their situational awareness. Among the profusion of literature on the subject, we can quote Kietzmann et al. (2011) who identified seven functional blocks of social media (Identity, Conversations, Sharing, Presence, Relationships, Reputation and Groups), and state that every social media tool focuses on some of these blocks. In a crisis-related situation, Alexander (2014) lists some functions for which social media can be used, such as listening, monitoring, searching, crowdsourcing, creating social cohesion or furthering causes.

While traditional communication between citizens and professionals used to be "from one to one", social media are shifting paradigms, and making crisis management a many-to-many communication system. Sometimes being alternative channels, sometimes even backchannels, they play an essential role in crisis response and management, both on professionals and volunteer sides (Sutton et al. 2008). Based on Reuter et al.'s (2011) communication matrix for a social software infrastructure (see Table 1), Grant et al. (2013) state that social media can play an important role for crisis management at operational and tactical levels between organizations.

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

Receiver / Sender	Organizations	Citizen
Organization	Inter-organizational crisis management	Citizen communication
Citizen	Integration, aggregation and validation of citizen-generated content	Self-help communities

Whether it is online or offline, official crisis responders know that citizens will always act during a crisis event. The very structure of communication and information sharing dynamics is changing both for emergency managers and the public (Alexander 2014). Thus, there is a value for both professionals and citizens to become aware of others' needs and behaviors, and contribute together to situational awareness.

Between citizens on the ground acting on different forms within different social structures, and citizens using social media to provide and organize information about the situation, there is a large range of crisis-related volunteerism types. From a volunteer firefighter acting within an official organization and receiving a

remuneration, to an individual spontaneous unaffiliated citizen using Twitter to share an information, volunteerism in crisis situations include a wide range of initiatives that we will need to classify if we want to think about integrating them into crisis management processes.

Categorizing the different forms of volunteerism in crisis situations

Based on previous work by Quarantelli (1966), the Disaster Research Center (DRC) at Ohio State University focused on the type of structure taking part to the response (old or new) and the type of tasks undertaken by the responders (regular or non-regular) to propose a first typology of organized response to disasters, presented in Table 2.

Table 2. The DRC typology of organized response to disasters (Dynes 1970)

	Regular tasks	**Non-regular tasks**
Old structure	Type I: Established	Type III: Extending
New structure	Type II: Expanding	Type IV: Emergent

Although today's crises are mainly managed by official organizations, it seems that spontaneous volunteerism is the first form of crisis management in history. Indeed, people spontaneously helped each other long before creating organizations to do so. (Orloff 2011) Thus, we can expand the DRC typology to other forms of volunteerism that appear outside of organizations. Stallings and Quarantelli (1985) define emergent groups as "private citizens who work together in pursuit of collective goals relevant to actual or potential disasters but whose organization has not yet become institutionalized." These groups include a more specific type: *spontaneous volunteerism*: "people who offer assistance following a disaster and who are not previously affiliated with recognized volunteer agencies and may or may not have relevant training, skills or experience" (Cottrell 2010). Although emergent volunteerism can appear at any phase of the crisis cycle, spontaneous volunteers are a specific form of volunteerism that only appears in the response phase, once a crisis occurs. (Whittaker et al. 2015)

Based on this distinction between anticipated and spontaneous volunteers, and distinguishing the volunteerism whether it is within an organization or not, Shaskolsky (1965) proposes four different types of volunteerism, with examples to illustrate the four cases. See Table 3.

Table 3. Examples of the different types of volunteerism (Shaskolsky 1965)

	Individual	**Organized**
Anticipated	Doctor	Regular volunteer firefighter
Spontaneous	Search and rescue by bystander	Non-regular volunteer firefighter

As presented by Cnaan et al. (1996), the intended beneficiaries, i.e. the interests that the volunteer has in mind, are also a criteria to take into account. Based on the opposition between altruism and egoism, described by Durkheim (1933 p. 198) as "two sides of conduct [that] are found present from the beginning in all human consciences", Wolensky (1979) distinguishes the motivations of volunteers between public and private interests, to present four types of "post-impact" volunteerism in Table 4.

Table 4. The four types of "post-impact" volunteerism (Wolensky 1979)

Social Form / **Motivation**	**Emergent**	**Organizational**
Public Interests	Altruistic	Communalistic
Private Interests	Egoistic	Mutualistic

Here are some insights regarding these volunteers' motivations:

- **Altruistic volunteers** have a genuine concern for human safety and neighborly aid;
- **Egoistic volunteers** put their private interests before those of the community;
- **Communalistic volunteers**' action is aimed at the entire community, its members and their problems;
- **Mutualistic volunteers** provide help primarily to fellows sharing common characteristics.

PROPOSAL – CATEGORIZING VOLUNTEER TYPES TO FOSTER CITIZEN INTEGRATION

When looking at the several attempts to classify the different forms of volunteerism, it appears that different dimensions are used. The Table 5 below presents the previously-used dimensions to categorize volunteerism types, their semantic equivalents, and corresponding references.

Table 5. The various dimensions that have been used to distinguish between volunteerism types

id	Dimension	Equivalents	Examples in literature
1	Affiliated / Unaffiliated	Formal / Informal; Official / Unofficial; Organized / Individual; Organizational / Emergent; Old / New Structure	(Cnaan et al. 1996; Dynes 1970; Shaskolsky 1965; Whittaker et al. 2015; Wolensky 1979)
2	Action / Information	Real / Virtual; On-site / Online	(Reuter et al. 2013)
3	Skilled / Unskilled	Regular / Non-regular tasks	(Dynes 1970)
4	Anticipated / Spontaneous		(Shaskolsky 1965; Whittaker et al. 2015)
5	Public interests / Private Interests	Intended beneficiaries: Others / Relatives / Oneself	(Cnaan et al. 1996; Wolensky 1979)
6	Remuneration: None / None expected / Expenses reimbursed / Stipend, low pay		(Cnaan et al. 1996)
7	Free will / Relatively uncoerced / Obligation		(Cnaan et al. 1996)

As showed before, volunteerism is a broad concept. Thus, the classification dimensions depend on the angle of view from which the concept is viewed (i.e. from which stakeholder we want to understand volunteerism) and on the filter that is placed on the lens (i.e. the objective we have in mind). Indeed, the research goal here is not to decide whether or not a citizen behavior should be considered as volunteerism, as it was for Cnaan et al. (1996), but to help official crisis responders to take decisions regarding whether or not a citizen initiative should be integrated to the crisis response.

To do so, the first categorization dimension that seems essential, and present in almost every literature, is the social structure in which the citizen initiative takes place (1). Although the term and its meaning are not exactly the same in every reference ("structure" for Cnaan et al. and Dynes; "organization" for Shaskolsky, Wolensky and Whittaker et al.), it appears that every author deals with the formalism level of the citizen's social structure.

Secondly, it is important to make a distinction between information and action (2). As Reuter et al. (2013) stated, whereas "real" volunteers are directly acting on the ground, "virtual" ones provide information about the situation, and help to understand what happens on the ground. In that sense, whereas citizens' will and ability to act in times of crisis have always been present, the emancipation of ICT, and in particular social media, has disrupted the construction and circulation of information during a crisis event.

Thus, given a volunteer initiative, the two first questions we want to answer are the following:

- **Who?** Are these citizens acting by themselves, in group, or are they registered within an organization? This volunteer initiative's social structure will be called *Status*.
- **What?** Are these volunteers focused on improving the situational awareness thanks to information, or are they focused on the action on the ground? This dimension will be called *Focus*.

Although the skill level (3) is an essential criterion for crisis responders to take decisions about whether or not to integrate a volunteer initiative, it doesn't appear as a convincing criterion to distinguish two volunteers in a taxonomy. Indeed, amongst the unaffiliated volunteers, each can be divided in two sub-categories depending on the skill level for this specific task. Thus, the skill level can be seen as a third dimension in the taxonomy, whether it is a binary or continuous axis, and knowing it given a citizen initiative, it could help the decision taking regarding this volunteer. In addition, the boundary between dimension "Skilled / Unskilled" (3) and dimension "Anticipated / Spontaneous" (4) is thin. Indeed, if we look at Shaskolsky's interpretation, we can consider that a citizen having skills for a specific task will be considered as an anticipated volunteer to do it, whereas a citizen acting without any skill regarding the task he/she is doing will be considered spontaneous for this task. In this way, a third dimension in the taxonomy could join these two aspects (dimensions 3 and 4) as a degree of the volunteer's inclination to help.

Given the integration objective, it doesn't appear to be useful to take into account several dimensions of the Table 4 above, such as the remuneration (6), or the free will (7), which were dimensions used to identify if a given behavior should be considered as volunteerism or not. Finally, regarding the interests (5), further discussions with crisis management stakeholders will need to be done to state about the relevance of this dimension.

A two-dimension taxonomy of volunteerism types: Status and Focus

When dealing about the volunteers' status, the main distinction that appears is about the degree of formalism of the volunteer initiative, which we divided in four levels:

- **Individual volunteers** are citizens taking decisions by themselves regarding their behavior in the crisis management;
- **Group volunteers** are citizens acting together and taking common decisions to address specific needs;
- **Organized volunteers** are citizens officially affiliated to an organization or registered through an application;
- **Formalized volunteers** are organized volunteers whose organization or application has been officially recognized by crisis responders.

Regarding the focus, we divided the volunteers depending on if they are focused on information or on action. This is an equivalent of what Reuter (2013) called "virtual" and "real" volunteers, but considering that even citizens using traditional communication channels (e.g. phone calls) are considered as "information volunteers". Thus, we identified four types of focus:

- **Organizing information** are volunteers focused on the information filtering, analysis and organization to provide an insight on the crisis situation;
- **Sharing information** are volunteers using the communication tools in their possession (social media, phone…) to spread information that might help to improve situational awareness;
- **Managing action** are volunteers that take decisions regarding who should do what, to assign tasks to other stakeholders;
- **Doing action** are volunteers carrying out actions on the ground.

Given these two dimensions, the Figure 1 presents different examples of volunteerism, depending on the level of status and the type of focus.

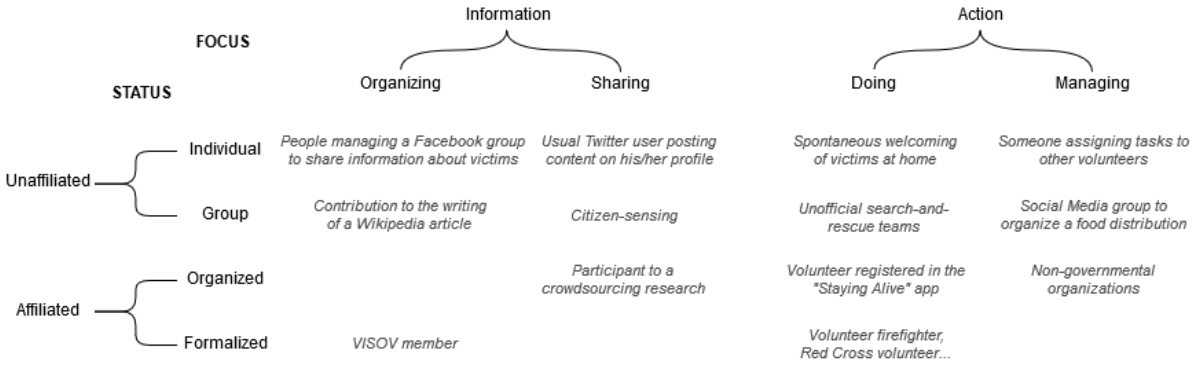

Figure 1. Taxonomy of volunteerism types with examples

One interesting example is the status of the VISOV association in France. Indeed, the association started with a group of people looking at social media in times of crisis to find useful information and share it with the crisis responders. It then became an association, and progressively signed agreements with official crisis management institutions in France, such as the Ministry of the Interior or several regional fire brigades, becoming then a formalized association. Now, when an important event happens, the VISOV are 'activated' as an official intermediary organization between citizens and crisis responders.

Moreover, in this matrix, we can find some groups of volunteers identified in previous literature, as presented in Figure 2. For example, any volunteer focused on sharing information is providing *User-Generated Content (UGC)*, which is "media content that is created or produced by the general public rather than by paid professionals and is primarily distributed on the Internet." (Daugherty et al. 2008) A sub-category of UGC is the *Volunteered Geographic Information (VGI)* (Goodchild 2007; Zook et al. 2010): "spatial data that are produced and disseminated by individuals or non-official institutions, i.e. by ordinary citizens using appropriate tools to gather and disseminate their views and geographical knowledge on the web" (Horita et al. 2013). As another example, on this map of volunteer types, we find the Intermediary Organizations, described by Zettle et al. (2017) as "a voluntary association of individual and/or collective civil society actors and acts as an intermediary between public authorities and the civil society."

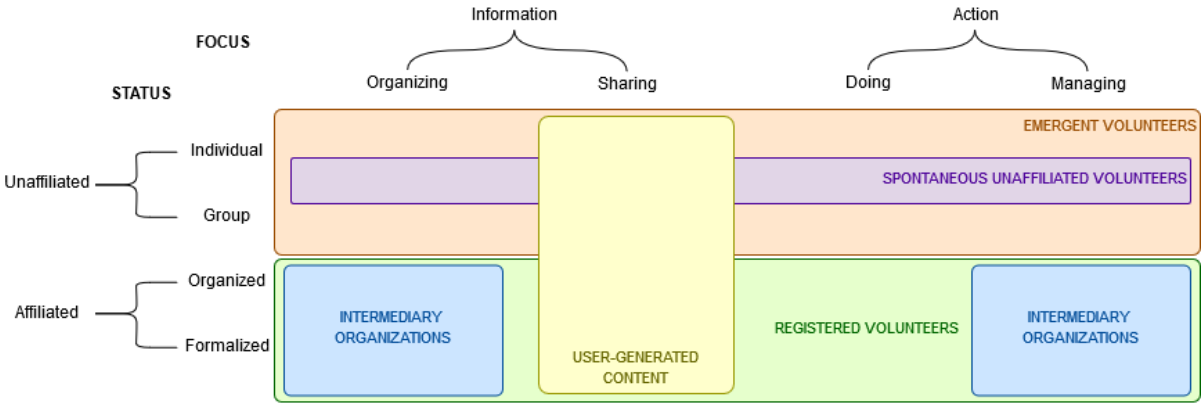

Figure 2. Different forms of volunteerism represented within the frame of the taxonomy

Towards integration of volunteerism into crisis management processes

The first thing that we can notice about this taxonomy is that the *status* axis can be seen as a degree of reliability of the citizen initiative. As official responders communicate closely with formalized organizations during the crisis response, it becomes more difficult for them to integrate those at the lower level of the status axis, i.e. the individual unaffiliated volunteers.

If we look at the *focus* axis, considering the current situation in France, and based on exploratory interviews we have conducted with crisis responders (from the Ministry of Interior and the Var region fire brigade), it appears that professionals tend to pay attention in priority to forms of volunteerism that focus on organizing information, such as VISOV. As the crisis gets worse, they will progressively broaden their attention to raw information shared by citizens. Then, in extreme cases, they will think about integrating less formal volunteers managing and doing actions on the ground. Indeed, for professionals, integrating volunteers to the response is risky. Firstly, when it comes to integrating information provided by citizens, especially from social media, several challenges appear,

regarding data quality, trust and format, and social media can lead to rumor propagation, panic, or rise new ethical challenges (Alexander 2014; Crawford and Finn 2015; Rizza and Pereira 2014). Secondly, interviews we have conducted with crisis responders show that integrating citizen action remains the most challenging part for professionals. Whether it is about supporting or just letting the action being done by a citizen is for professionals a risk of endangering an individual whose own objective should be his/her own safety.

Last but not least, first discussions with official crisis responders, volunteers and researchers in the field tend to indicate that as the crisis situation becomes more complex, the professionals' decision-making process tends to be disturbed because of stress, uncertainty, time pressure, heightened public scrutiny and cognitive overload, which could result in tunnel vision and information bias (Cao et al. 2008; Schraagen and van de Ven 2008; Svedin 2011). Thus, in a highly chaotic crisis, we can assume that a large range of volunteerism types will be present, bringing a lot both on the action or on the information side, but the professionals might close their cooperation doors to focus on a small range of tasks they have to accomplish with partners they already know.

Given these considerations, we make the assumption that there are different levels of severity of the crisis at which it could be relevant for professionals to take citizen initiatives into account. The more complex the crisis, the more diverse the citizen initiatives will be. At the same time, it should be considered that the more complex the crisis, the more opportunities professionals will have to integrate these initiatives, starting with the most formalized and information-focused ones, and progressively opening their mind to less formal, more spontaneous and action-focused initiatives. Thus, based on the taxonomy presented before, we can develop a map of levels of opportunities of volunteer consideration in the crisis response, depending on the severity of the situation (i.e. the "degree of chaos"). This map is presented in Figure 3.

Note that in this hypothesis, the "degree of chaos" is a notion that might rely on a diversity of parameters that can affect the complexity of the situation. As a first attempt to specify this *degree of chaos*, the influencing parameters could be the crisis type, its duration, the variety and volume of the needs professionals have to address, the professionals' competences and resources, the ethical, legal and social aspects regarding the integration of a citizen, or the risk that this integration might represent. The *degree of chaos* can be seen as an extension of Franco et al's "disaster impact index" (2008), and further research is needed to clarify this concept.

Future research will be conducted to refine the parameters influencing these opportunities, and to understand professionals' needs, to help them converting an opportunity into a concrete integration of an initiative.

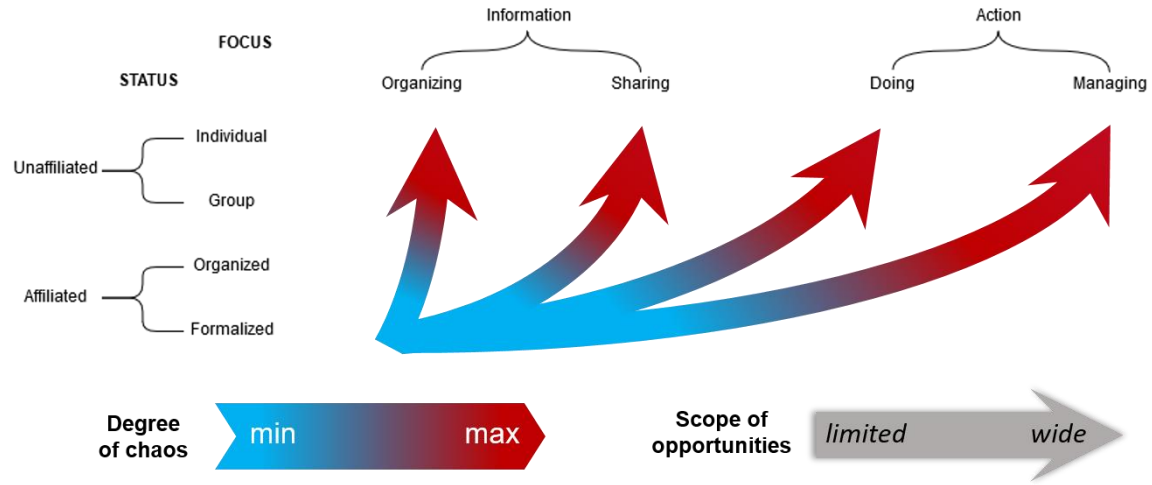

Figure 3. Scope of opportunities of volunteer consideration by professionals, regarding the degree of chaos of the crisis

ANALYSIS AND DISCUSSION

Regarding the taxonomy itself, one important dimension that doesn't appear is the skill level of the volunteer regarding the action he or she is doing (i.e. *regular* / *non-regular tasks* (Dynes 1970)), combined with the spontaneity of the initiative. As presented before, these parameters could be joined as a third dimension in the taxonomy, representing the volunteer's inclination to help.

Having in mind the goal of integrating citizen initiatives, or at least be aware of them during a crisis response, it could be relevant to think about prioritizing the volunteerism forms that might be relevant to take into account.

To do so, other interviews will be conducted with official crisis management stakeholders, to understand their needs regarding the understanding of citizen behaviors. In addition, it could be relevant to identify the likelihood of the presence of the several types of volunteers in each kind of crisis, in each kind of environment, to complete the official responders' needs and help to prioritize the focus on several volunteerism types. Specifying the decision-makers' needs could also help to dispel their tunnel vision and cognitive overload by providing relevant advice, and thus make them more open to the integration of new initiatives.

Moreover, developing a taxonomy is always a risky exercise, as it should be kept in mind that the objective is to help the understanding of the types of volunteerism to help the professionals' decision taking, and not to lose the subtlety of human behavior by putting a label on a volunteer profile. Thus, given a citizen initiative, the only fact of identifying its status, its focus, or its skill level will not be comprehensive enough to describe precisely this initiative. In future research, more details will need to be provided regarding this initiative, based on the professionals' needs.

As volunteerism is a constantly evolving concept, it is important to remain aware that the diversity of volunteerism types will evolve as quickly as the crisis will do. The inventiveness and improvisation of citizens in times of crisis might always bring to the light unpredictable types of volunteers. Thus, whatever method is used to understand and integrate citizen initiatives, it must be sufficiently inclusive not to close the door to these emerging forms of volunteerism.

CONCLUSION

Resulting from a diversification of citizen initiatives thanks to the development of social media, volunteerism in crisis situations is a vast concept that official crisis responders need to comprehend in order to improve their situational awareness, and at the same time, their response to the crisis. The taxonomy of volunteerism types presented in this article is mainly based on a literature review regarding volunteerism in crisis situations, and previous attempts of categorizing the volunteers.

Given the objective to provide crisis responders an insight on what citizens are doing during a disaster, this article presents a two-dimension matrix of volunteerism types. The first dimension – the *status* – aims to identify the social structure in which the initiative takes place, going from an individual unaffiliated behavior to an affiliated, organized and officially recognized initiative. The second dimension – the *focus* – is dedicated to the type of initiative, depending on whether it concerns *information* that can improve the situational awareness, or *action*, which has a direct impact on the ground.

Future interviews and field observation will be conducted with official crisis responders to refine their needs regarding the understanding of citizen initiatives, and thus to refine the taxonomy presented in this article. For example, having more details regarding the skill level, the spontaneity, or even the motivation of citizen initiatives might be relevant parameters for the professional's point of view.

To make use of such a taxonomy, the research can then think about the parameters that can influence the professionals' decision making regarding the integration of a citizen initiative. As an example, based on exploratory interviews conducted with official crisis responders, this paper presents the idea of a hypothetic "degree of chaos" which might rely on a diversity of parameters linked to the crisis situation, and that might be deterministic for professionals' decision about taking into account or not this or that citizen initiative. However, the information overload faced by crisis managers in complex situations reminds that there is a significant gap between having the opportunity to integrate an initiative, and concretely integrating it.

As the decision making in crisis centers relies mainly on the information professionals have, the next steps in this research project will be to conduct interviews with both professionals and volunteers in order to 1) understand professionals' needs regarding the understanding of volunteers; 2) present a comprehensive map of volunteers' contribution in crisis situations and 3) find relevant information to provide to the crisis responders regarding the real-time citizen initiatives, and help them to take decisions about their integration.

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