Understanding citizen participation in crisis and disasters: the point of view of governmental agencies

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ABSTRACT

Ubiquitous computing combined with web 2.0 technologies might contribute to develop a culture of participation in emergency management (EM) by aligning the efforts and capabilities of official agencies and citizens. For citizen participation to be possible organizations in charge of EM need to realize that involving citizens does not interfere with their protocols and citizens need to be empowered to move beyond the role of passive informants. In this paper we describe how organizations perceive this participation as a step further to understand how to reach a more participative model and the benefits that technology and sociotechnical systems might bring to such model.

Categories and Subject Descriptors

H.5.3 [Group and Organization Interfaces] – collaborative computing

Keywords

Community-level emergency management; cultures of participation; citizen 2.0.

1. INTRODUCTION

Citizens are always the first responders in any crisis or disaster since they are the ones who are in the affected area [1]. This participation is usually limited to provide information to the authorities so that they can respond better to the situation. Mechanisms such as social networks, blogs, or micro-blogging are forms of viral communication that have already given a voice to citizens in major disasters [2]. However, informing and consultation might be considered forms of tokenism in citizen participation [3], a way to give citizens the impression their opinions count but without authorities losing power and control on the situation. Real citizen power is reached at the higher rungs of the "participation ladder", when citizens work as partners, and they can exert power and control the situation.

Current advances in technologies such as ubiquitous computing and the web 2.0 might help to promote an active participation of citizens in emergency management (EM henceforth) and, in this way, contribute to generate resilient communities that have their own capacities and resources to deal with hazards and disasters. The goal would be to implement the concept of Community-level EM that relies upon the citizens' social capital to be prepared, respond, recover or mitigate the effects of disasters [4]. For such participation to be possible citizens need to be empowered to go beyond the role of passive informants and organizations in charge of EM have to realize that involving citizens does not interfere with their protocols making them less efficient.

Many studies report about the use of technology by citizens during crisis [2, 5] but to the best of our knowledge there are no studies analysing the problem from the other perspective: the governmental organizations and corps in charge of EM. In this position paper we present the results of two studies we conducted with EM professionals to understand how they perceive citizen participation and the role technology can play in a more participatory model.

2. Understanding the perception of citizen participation

Many EM governmental organizations view participatory government as a way to improve their response capacity as well as a mechanism to facilitate accountability to society. For example, the best marketing campaign for Eurocontrol was probably the use they did during the Eyjafjallajokull ash cloud crisis that increased its followers from 300 to 7.000 in just one day [6]. However, participation is much more than information and governmental agencies still do not fully exploit technologies to integrate citizens in their operation protocols. Citizens can track alerts, collaborate in the local response, support community preparation or recovery processes [5]. They can act as intelligent sensors that provide valuable feedback on the situation since they are familiar with the area and they are increasingly equipped with technologies like smartphones that empower them to capture relevant information. There are many roles citizens will be willing to play in this context but it is also necessary to understand how governmental agencies value this participation. As stated in [7] end users acceptance of a technology in organizational setting strongly depends on the perception that "*using a specific system will increase his or her job performance*". This is particularly true in a context like EM when efficacy turns out into economic or human loses. To understand the perception of organizations we carried two studies with EM professionals.

2.1 Social media and EM

Many studies report about the use of social media by citizens during crisis [2, 5] but it is not clear how do agencies perceive their utility. Our first study was run in August 23rd 2012 and it was mainly focused on confirming the challenges and opportunities of using the web 2.0 in EM. The 36 participants represented 18 different agencies from the areas of British Columbia and Washington State [9] and made up a heterogeneous group of professionals with different levels of expertise and real experience in managing disasters. After a talk on social media and its use in EM, participants filled a questionnaire that gathered questions to explore the utility and potential problems of using web 2.0 technologies in their daily practice to receive information from citizens, inform them or enable participatory processes. At the end of the study, a discussion was open to go deeper into some

of the issues raised in the questionnaire. As reported in [8], all the participants valued web 2.0 to establish a fluid communication with citizens though they found problems to manage properly this new media because of the quantity of data and the heterogeneity of the sources, not all of them trusted. However, they only though on information purposes not on the possibility of delegating responsibilities to citizens. These results are similar to those published in the NEMA report based on a web-based survey [9].

2.2 Analysing the current and future citizen participation

In the Spring of 2013 we did a new the study since the use of social networks had already become a reality in most crisis and disasters, but there was still room to increase citizen participation using other technologies. In this case we run a longer term study creating a web questionnaire and inviting several organizations to access it. Participants were 29 emergency practitioners (professional paid workers) who belonged to 7 different organizations in charge of cities or regions that in total involved more than 3,5M people. Participants were asked to evaluate the current participation of citizens and how this participation could evolve using likert-scale questions ranging from 1 (lowest level) to 4 (highest level).

Current citizen participation was assessed generally low (μ=1,69; σ=0,76), except for emergency services volunteers in which it is slightly higher (μ=2,89; σ=0,98). These results confirm the relevant value that trusted people like volunteers play. Indeed, the Virtual Operations Support Teams (VOST, vosg.us) movement that relies upon organized groups to use and monitor social media during emergencies, is gaining presence in most crisis.

The main problems identified were basically the same that appeared in the previous study: lack of trust in the information provided by the citizens (μ=3; σ=0,27) and lack of resources to deal with the information in real situations (μ=2,76; σ=0,87).

The most interesting part of the study was about trying to identify potential roles and activities in which user participation could be increased from the point of view of the organizations. Thus, to characterise potential roles three options were assessed: citizens as mere informants (called *sensors*), citizens reacting to an event under the supervision of authorities (called *reactive sensors*) and citizens taking the lead in EM activities (called *proactive sensors*). Surprisingly the preferred role was *reactive sensors* (see Figure 1), that is, organizations would like more engaged citizens. Indeed, the main barrier to move to proactive sensors in the words of one of the participants was that "*you need to invest in preparation and training before trusting them*".
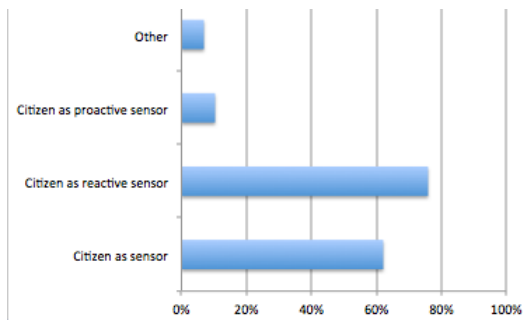

Figure 1. Assessment of different citizen roles

Participants agreed with the need to increase citizen participation in many tasks and phases of the EM process as summarised in Table 1. The highest values were obtained for understanding how professionals work, getting ready for emergencies and being better informed.

Table 1. Aspects that could be improved in citizen participation (values range from 1-strongly disagree to 4-strongly agree)

	μ	σ
The communication channels between citizens and professionals should be improved	3,45	0,33
The participation of formal groups of volunteers should be fostered	3,27	0,20
Citizens should be more aware of how professionals respond to an emergency	3,58	0,25
Citizens should know that they have to be prepared and know how to react	3,62	0,24
The dissemination of information amongst citizens should be more effective	3,48	0,33
It would be necessary to guarantee the trustworthiness of the information provided	3,34	0,38
Citizens should take a more active part in following the alerts	3,07	0,57
Citizens should take a more active part in the recovery process	3,03	0,46
Citizens should take a more active part in the response process	3,03	0,25
We should be able to process the information provided by citizens in a more efficient way	3,27	0,28

3. THE FIRST STEP TO INTEGRATE CITIZENS: IDENTIFYING ECOLOGIES OF PARTICPANTS

In our study, participants valued the role of citizens as information providers and reactive sensors directed by authorities. However, more roles might be possible taking into account that citizens are not a homogenous crowd, but a heterogeneous one made up of people with different capabilities and abilities. For instance, retired members of the EM corps, volunteers or citizens who have followed training courses could act on their own and provide additional support in EM. The different profiles making up the such a heterogeneous crowd of citizens need to be conceptualized before ideating IT applications that will eventually improve their participation in EM.

With this purpose, we created a model of ecology of participants [10] that enlarges the number of profiles from our previous study. The ecology was validated in a focus group with professionals and policy makers from Madrid 112, the operation centre where the different corps and agencies in charge of Madrid Community collaborate to respond to emergencies. Six participants took part in the focus group, representing the police, firemen, forest services and ambulances services, and the operational centre. All of them had more than 5 years of experience in managing EM services for the whole Community of Madrid that has a population of 3.2 million of residents. Figure 2 shows the initial ecology of participants.
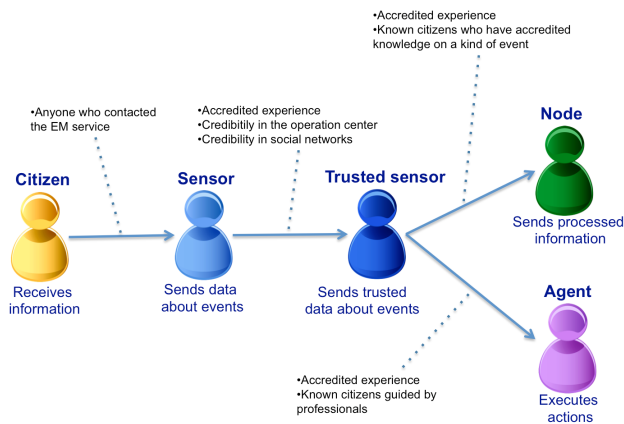
Figure 2. Ecology of participants in participatory emergency response

This conceptualization includes the migration paths between roles (the arrows in Figure 2) and the conditions that the participants established to move from one role to the other. For instance, the profile *Node* represents citizens that can elaborate data and send valid information, such as an evaluation of the situation or a request for help. For this to be possible, the citizen has to be an accredited knowledge so that authorities can trust her information. The ecology assists designers in devising applications that might improve citizen participation in EM taking into account the constraints and perceptions of professional emergency managers and workers. Indeed it is being used to identify the capabilities each role could provide to the agencies and which processes and technologies are required to take profit from such capabilities.

4. CONCLUSIONS AND LESSONS LEARNT

In this paper we analyzed the perception of governmental agencies about integrating citizens in emergency management. We presented the results of two studies we conducted that helped us to identify potential roles of citizens according to perception of utility by the governmental agencies.

In order to reach a satisfactory outcome, both sides, the citizens and the corps and organization in charge of EM, need to be empowered to work together in a trusted and efficient way. From our point of view, technology that goes beyond informing citizens cannot be deployed if the agencies responsible of managing the crisis do not rely on it. No agency will delegate power without being sure that such delegation will contribute to make them more efficient and provide a better service to citizens. Social networks are powerful mechanisms to broadcast viral information, but there is no sense on giving everybody the word when none will be heard. Consequently, participatory design processes analysing the expectations of organizations and citizens are required to align the potential of technologies with the real needs and capabilities.

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