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(Article begins on next page)

From élites to collaboration: towards a resilient approach to natural hazards analysis & emergency management

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The presentation illustrates the background and the aim of the research project “Collaborative management of data for natural risk prevention and civil protection”¹ at the Doctoral School of Sciences and Innovative technologies of the University of Torino, Italy.

From Protection to Resilience

It is acknowledged that major and minor disasters are a “reality” to cope with, as they are part of our environment. In the last 20 years the wider debate on disasters preparedness and relief operations underline that our culture should switch from “war” against hazards to “preparedness” in order to decrease the vulnerability of our societies [Wisner et al., 1994]. In this perspective the key word “resilience” fosters a wider cultural change that should drive the risk & emergency management towards a participatory dimension of all the key players: scientific communities experts, civil protection bodies, media, citizens, volunteers, civil society. The aim is to “develop a network between all civil protection actors and interested parties, including the private sector; increasing the knowledge of new prevention, preparedness and response technologies available on the market; and raise public awareness [3rd EU Civil Protection Forum - Bruxelles, 2009]. This could be interpreted as a call to switch from protection (passive behaviour) to resilience, increasing the user\citizens\local-bodies responsibility and proactive behaviour.

The post-Gutenberg revolution as innovation driver of the information flow in Disaster Cycle

The web 2.0 revolution is a twofold reality: technological and cultural. The widespread diffusion of web 2.0 technologies is changing the overall organisation of information production [Benkler, 2006] and depriving the institutionalised mediations models. The new actor in the information scene is the crowd and its talent in producing, disseminating, selecting and promoting information. Besides the validation and reliability implications, the “talent of the crowd” represents

in se a dramatic innovation in the disaster scenario, to cope with. Moreover the technological development is having a huge impact on GIS and more generally on geographic disciplines. As a matter of fact information is becoming more and more “geolocation dependent” and this is witnessed by the “geographic phase” of social media. The “democratisation of GIS” [Butler, 2006], started with Google Earth, and mash-ups created by common people [Goodchild, 2007] (e.g. Ushahidi platform) are now changing the whole background, with important consequences in risk prevention and emergency management. Key-words such as “crowdsourcing” and “crowdmapping”, state that the worldwide citizens community is becoming a main player in the volunteered geographic information (VGI) production [Goodchild, 2007] during crisis and emergency events. This democratisation of the information, supported by the VTC (Volunteers Technical Communities) enhances that collaboration, enabled by web technology, could represent a radical change in the whole Disaster Cycle (fig. 1), that involves not only citizens but also scientific community, institutions, experts, relief bodies, media representatives.



Figure 1 – The Disaster Cycle (What makes a disaster? by Ian Davis,- <http://goo.gl/FK7Jq>)

¹ MIUR scholarship “Progetto Giovani” in the Research field “Sistemi di telecomunicazione innovativi a larga banda anche con impiego di satelliti per utenze differenziate in materia di sicurezza, prevenzione e intervento in caso di catastrofi naturali”

In this perspective collaboration becomes not only a citizens approach, but also a challenge for scholars and practitioners. A collaboration trend whose aim is to produce, exchange, and share information in a world wide open and free environment, in the stream of Open Government and Open Data. Web & mobile access are enablers and channels for achieving:

- citizens engagement in preparedness, planning, early warning, relief, restore;
- faster relief with improved situational awareness;
- communication strategy both bottom/up and top/down;
- resilience enhancement with local storytelling.

The Research Project: Collaborative management of data

The background of our project is the analysis of the Varazze flash flood event, April 10, 2010 (Lanfranco & Rapisardi, 2011). By taking into account the web 2.0 revolution and the international best practices, the Varazze case study outlined:

- To what extent web 2.0 mobile technologies and tools would have changed the scenario?
- How to develop a “resilient information” flow both bottom/up and top/down?
- How to manage the crowdsourced information in a risk and emergency management perspective?
- How to raise citizens and media awareness on information need during crisis and in the whole disaster cycle?

Later, on november 2011 another succession of flash floods struck both Tuscany and Liguria regions, resulting in a loss of lives and in extensive damages. Right after the disaster, citizens, social media and citizens journalism platforms (e.g. youreporter.it) played a unique role in producing information and documenting the events. They became the main informations source for national media (e.g. TV, radio, online newspaper) as this information was in real time and from the field. On the other end, the institutional information was slower, scattered, and had difficulties to get into the social stream.

The first step: bottom/up mash-ups

1. Crowdmapping - Actors involved: *Citizens – Media - Scientific Community*

A joint initiative set up by UNITO-Dep. of Earth Sciences and Gruppo Editoriale L'Espresso. A crowdmap, for study purposes only, to gather and classify damages through information reports, videos, and photos generated by citizens. The aim was to transform user generated information into volunteered geographical information (VGI). The involvement of a media national publishing group is two fold: wider coverage of the initiative, collaborative involvement of the editorial staff, in the gathering of information for scientific purposes. [<http://alluvione2011.crowdmap.com/main>]

2. Geolocated photo sharing - Actors involved: *Project team - Relief Bodies*

The project team experimented the geolocated photo sharing in real time with the operational centre. [google+ photosharing tool and Picasa] This first test simulated a sharing approach to be developed between relief bodies and citizens or volunteers.

3. Geolocated assessment - Actors involved: *COC [Municipality Operational Centre], civil protection operatives and volunteers*

In order to exchange and share information the COC of Mulazzo set up a privately-shared google map to geolocate landslides and related damages. This map allowed different actors to “view” in distance the same information for supporting the decision making process.

The next step: Resilient Information

On the basis of this first test, the project will design and experiment a *Geosciences Information Stream*, enabled by web 2.0 app and tools, that involves in a continuum “users” and “contributors” of the disaster cycle.

Particularly, starting from the November flash flood case studies, the research project will outline practices and web/mobile tools to set up a collaborative multilevel environment in order to improve and practice:

- the sharing of reliable and acknowledged geographical information, such as geological maps, hazard maps, enviromental status, weather forecast. Including the Open Data issue;
- the collaborative management of geodata stream from different sources for risk management and decision making;
- the raising awareness on natural hazard and emergency issues (preparedness) to better cope with risks.

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