Italian Civil Protection 2.0: Towards a Resilient Information Management Framework

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Abstract

The web 2.0 revolution is a twofold reality: technological and cultural. The widespread of web 2.0 technologies is changing Disaster Resilience. Information in science communication is the ability and the capacity to transfer scientific knowledge to enable the understanding of communication content. Particularly a clear and correct information on hazards and emergency matters is crucial, either for practitioners and population, to cope with disaster and to allow collaboration, and to take the best decision. Hence, web 2.0, allowing a better information sharing and widespread, could represent a leverage to foster an Information Preparedness approach, so to better cope with disasters. However a Web Information Preparedness in Disaster Resilience requires an overall strategy that can have an impact both on the cultural side (knowledge sharing and collaboration) and on the organizational one. How civil protection bodies can benefit of this global changes to better inform citizens? How to implement and manage a new Resilient Information Preparedness approach enabled by web technologies?

Keywords

Web 2.0 • VTCs • Information management • Disaster resilience

34.1 Web 2.0: The Challenge for Institutionalized Mediation Models

Timely and accurate information is recognized as integral to emergency response. Amongst the principles of Information Management proposed by Office for the Coordination of Humanitarian Affairs (OCHA) in 2002, Accountability and

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Verifiability are key to evaluate the reliability and credibility of data and information, highlighting the need for an information that is "accurate, consistent and based on sound methodologies, validated by external sources, and analyzed within the proper contextual framework" (OCHA 2002). Accountability and Verifiability of information becomes crucial, particularly in the emergency/disaster phase when information flows on the internet at a very fast speed, and information demand reaches its peak (Limbu 2012). As shown in Google Trend search trends for the words, fault and liquefaction, from 2009 (Abruzzo Earthquake) to 2012 (Emilia Romagna earthquake), two search peaks occur exactly when the two earthquake stroke. Presumably internet users were looking for the words fault and liquefaction, that belong to the seismic discipline, to better understand the earthquake as a natural phenomenon (event, process, factors, related effects…). The problem is related to search findings: how to discern content accountability and

verifiability, and also how institutions respond to the request for information, how they are using web 2.0 tools to build web presence and delivering information? Though Italian Legal Framework on Civil Protection and Public Administration regulations[1] outline duties and define web guidelines, the increased demand of information from citizens in emergency, and the state of the art of the institution in the web sphere, shows a critical the gap between institutional communication, usually by press release or through traditional media, and web information stream produced by the citizens. However a pervasive and fast propagation of citizens generated information, although exposed to the risk of inaccuracy or of a low level of liability, is filling the vacuum created by the dependency from old mediation models, exacerbated by a great heterogeneity and dispersive of the presences of institutions on the web, and by a usage of social media more as a channel for traditional communication rather than as channel to interact, and to give information on public utilities (e.g. emergency, weather alerts).[2] In case of emergency, the acceleration of the speed of information flow calls institutions not to react with a time-to-web strategy during the event, but to build an overall web strategy of information preparedness. In this perspective, the "peace time" can be understood as the time to build and consolidate a web presence or web reputation, aiming at helping people to understand the phenomena and the model of intervention of Civil Protection. Be prepared should not be limited to self protection behavior, but requires an effort to make explicit both the scientific knowledge on the natural hazards, and the actions to undertake to reduce the potential risk. But this could be accomplished only by planning an information management strategy, carried out by teams able to manage the overall information process.

34.2 Civil Protection Plan as Information Management Preparedness

Information management covers 'the various stages of information processing from production to storage and retrieval to dissemination towards the better working of an organization; information can be from internal and external sources and in any format.'[3] Data collection, processing,

analysis and dissemination are the different phases of the information management cycle. Hence the information management cycle should be included in each phase of the overall disaster cycle; and for each phase of the information management cycle tools, strategies, resources, competences will have to be defined. The new web technologies allow the implementation of information systems, tools, that can support a more efficient Information Management. In the Italian Civil Protection framework, the actor closest geographically and responsible according to the law is the mayor, who has also the duty of informing population. The Law 100/2012 recognize the higher-level of Civil Protection Plan with other planning tools and therefore the Civil Protection Plan is the main tool to start gradually to reduce the exposed elements at risk, and prevent new and inconsiderate use of soil increase the danger of the territories. Hence the Plan is not only operational, but constitute an increasing source of communication content. The Plan is therefore both Preparedness in terms of response and recovery planning and a tool for "data and information" preparedness. In this perspective a local Civil Protection website should be developed translating the civil protection plan into web content, setting up a first building block to organize knowledge and information focused on the territory, and with a user-centered perspective. But in order to give effectiveness and efficiency to such a tool, some operational principles should be identified, to guide information management and exchange activities. The website should be developed according to acknowledged web design principles and standards: : Information Architecture, Visual Design and Visual Representation, Cascading Style Sheets (CSS), Usability, Accessibility, Search engine optimization (SEO), Content Management System (CMS) (preferable OpenSource -OS- and Free, e.g. Drupal, Wordpress), Analytics to monitor website user and performances. The content structure should enhance operational principles for information exchange activities in emergencies defined by OCHA (Office for the Coordination of Humanitarian Affairs) in 2002 (Accessibility, Inclusiveness, Inter-operability, Accountability, Verifiability, Relevance, Objectivity, Humanity, Timeliness, Sustainability).

Figure 34.1 shows an example of the information architecture blueprints of a site of a local civil protection: the conceptual framework of the web content is based on the organization of knowledge in the domain: scientific, risk and emergency communication. The innovative elements of this architecture are: the definition of a unique taxonomy (thesaurus), SEO and metadata (e.g. dublicore compliant); integration with external terminological tools (Glossary, Wikis, Thesaurus) and interaction with other web platforms, to improve understanding and the explanation of the text; responsive for navigation via mobile phones; feed (e.g. Xml,

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[1] "Linee guida siti web delle PA 2011", "Vademecum Pubblica Amministrazione e Social Media", (e.g. L. n. 225/92 e L. 100/2012), D.lgs. 33/2013.

[2] OPERA, Unità di Ricerca del Centro di Ricerca GIUnO, Comuni 2.0, Utilizzo dei social network nei comuni italiani di medie e grandi dimensioni, Reggio Emilia, Università degli studi di Modena e Reggio Emilia; #FacebookPA (2013), A cura di Giovanni Arata, Nexa Center for Internet and Society, Politecnico di Torino.

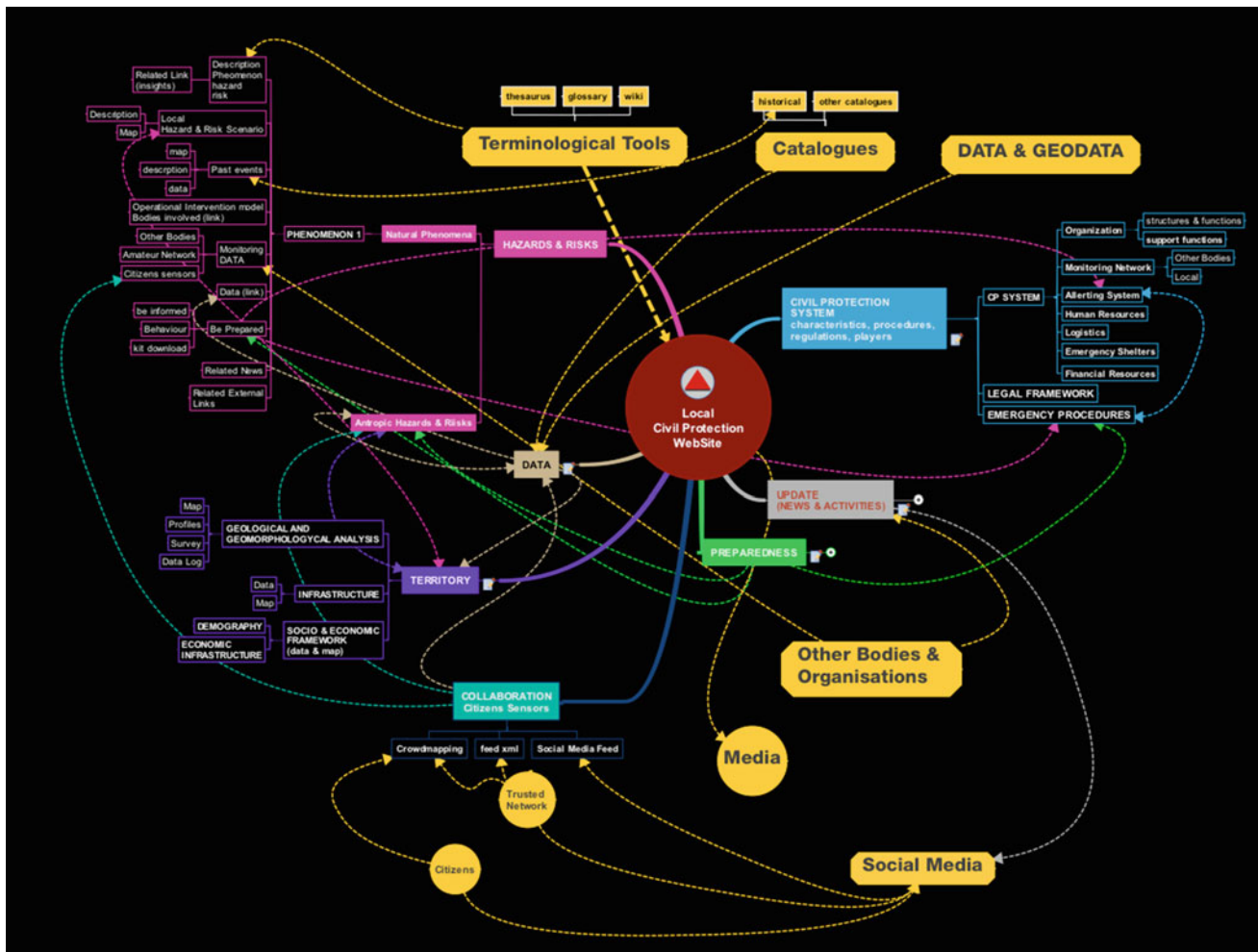[3] Association for Information Management 2005 (See http://www.aslib.co.uk).

Fig. 34.1 IA—blueprint local civil protection web site—larger view http://goo.gl/VZhB1z

GeoRSS, API),[4] crowdmapping and Social Media; outgoing feed towards social media platform, categorized RSS.

The website is divided into seven sections interrelated.

Civil Protection System: Who, What, How and When of the Civil Protection Organization, including legal framework and operation model of intervention.

Hazards and Risk: this section is organized by "phenomena" labelled in plain language (e.g.. Floods instead of Meteo-hydrogeological). Starting from the "phenomenon" is a way to make clear that a phenomenon is a natural process that can be an hazard and then a risk depending on the probability, exposure and vulnerability of the event. Each phenomenon is briefly illustrated in general terms (with link to web sites that explain in details the issue), and its characteristics in the local area are explained in terms of risk scenario; the visual representation can vary, but

interactive maps, video and commented illustration/photo are suggested. Other contents: past events in the area with brief description, how to be prepared; operational model of intervention, the related data and geodata (also feed from sources e.g.: institutional, amateur, and citizen).

Territory: overview of the area from geological, geomorphological, and climate perspective (map, profiles, survey, data log); infrastructure (data and map); socioeconomic context. An interactive map could visualize all this information at glance.

Preparedness: self-protection behavior and information sources by risk.

Data[5]: list of OpenData and Open Geodata (metadata information) organized by hierarchical Category, link to open data websites; data section can support transparency

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[4] Extensible Markup Language (XML), RSS (Really Simple Syndication) standard web feed format, GeoRSS standard for encoding location as part of a Web feed; application programming interface (API).

[5] The state of the art on open data at national level is heterogeneous, so is the adoption of EU INSPIRE (Directive 2007/2/EC). See also The Humanitarian Exchange Language (HXL) initiative for a "community agreement on data standards", and to develop "a technical infrastructure for automating simple peer-to-peer data exchange".

through validated data, and feed the situational awareness scenario.

News/Articles and Alert pushing via email-subscription

Collaboration/VGI: besides social media platforms, several other tools can be used for crowdsourcing or participatory activities, both in peace time and in emergency (e.g. crowdmap or mobile field data collection tools); an accurate planning is needed in order to carry out this activity, considering also the available resources and skills.

Visualization: MAPs: "The widespread engagement of large numbers of private citizens, often with little in the way of formal qualifications, in the creation of geographic information, a function that for centuries has been reserved to official agencies. […] But, collectively, they represent a dramatic innovation that will certainly have profound impacts on geographic information systems (GIS) and more generally on the discipline of geography and its relationship to the general public." (Goodchild 2007). The "democratization of GIS" empowered by web 2.0 technologies, contributed to the growing popularity and usage of location based information: mapping and mashups, to share information and to collaborate. On the basis of a vast scholarly literature and wide debate on this topic, we can assume the idea that maps could represent an "information service" to deliver information, related to hazard, risk and emergency. Moreover, in Disaster Resilience, web maps could ameliorate information sharing, support response activities, decision making and last but least to give guidance in case of emergency. Visualizing spatial information on a map, could potentially (as it is not data evidence) increase comprehension and understanding, support awareness raising, hence improving information to the public. Assuming that the geodata are available in a standard formats, there are several web mapping tools allowing map visualization. A web interactive map shows a representation of several characteristics of the territory either related to geology and geomorphology, or hazards/risks, or emergency management. In Fig. 34.2 an example of an interactive map on spatial seismic information - geology, hazard, risk, shelters-[6] that could be embedded into a web page and displayed on a mobile device.

Such web model,[7] tailored for civil protection purposes, has the potential to answer to several information needs both internal and external. A clear focus on phenomena, hazards and risks (provided that are expressed in explicit language and supported by terminological tools), both in a general perspective and in a local one, is a way to explain and ameliorate the comprehension and the understanding of when and how a phenomenon becomes an hazard, a risk or an emergency. In this perspective earth sciences and scenario planning competences are key to implement and develop a scientifically coherent content structure. Information should become a true user experience increasing citizen knowledge both of the territory and of the phenomena.

34.3 Who Manages Information Management?

Crowdsourcing enabled by web technology (mobile, internet) allows individuals to become observers and witnesses. A concrete and important example is the experience of Ushahidi set up in 2007 as a non-profit software company that develops free and OS software for information collection, visualization, and interactive mapping: the Crowdmap platform Ushahidi is so emblematic not only as experience of "citizens as sensors", but also as enabler of a structured and organized practice of crowdmapping. Undoubtedly, Volunteered Geographic Information (VGI) (Goodchild 2007), and other type of user-generated-content, either spontaneous or from trusted networks, can effectively contribute to increase situational awareness, through their observations from the field. However this new practice raises two issues: the validity, precision and accuracy of information (risk of information) and the skills necessary to produce or select valuable observations. The Ushahidi Crowdmap has been designed envisaging validation and approval as key tasks to be performed so to make citizens reports accountable. Furthermore this seemingly simple validation process can be "distributed" and run by a subset of the "crowd", or by groups of skilled volunteers placed in different places, which are named Volunteer Technical Community, (VTC) as the Ushahidi Stand By Task Force (SBTF) launched in 2010 (Capelo et al. 2013). VTCs give support performing tasks such as media tracking, validation, geolocation, mapping, data cleaning, translation, and social networks monitoring; they add value to crowdsourced data and information, playing a crucial role in the information management process, also by giving support to organizations, particularly local organizations, who have neither the means nor skills to manage information/data with new technologies. The ability to create flexible and open team, where people with different skills are called to work together remotely, is reshaping the relationship between responders, scientists, citizens, experts, volunteers and last but not least, institutions. VTCs, SBTF experiences highlight that digital spontaneous volunteering could be at risk in disseminating false or misleading information (Robson 2012), or their action becomes less effective when there is a lack of coordination with the institutional bodies and responders. These weak points suggest the definition of new

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[6] Google Crisis Map, an OS tool to create and visualize maps for crisis, humanitarian, and non-profit purposes. Format: KML, GeoRSS, WMS, Fusion Tables, Google Maps Engine.

[7] In the next future, the web model of information management here proposed could be potentiated by linked data technologies.
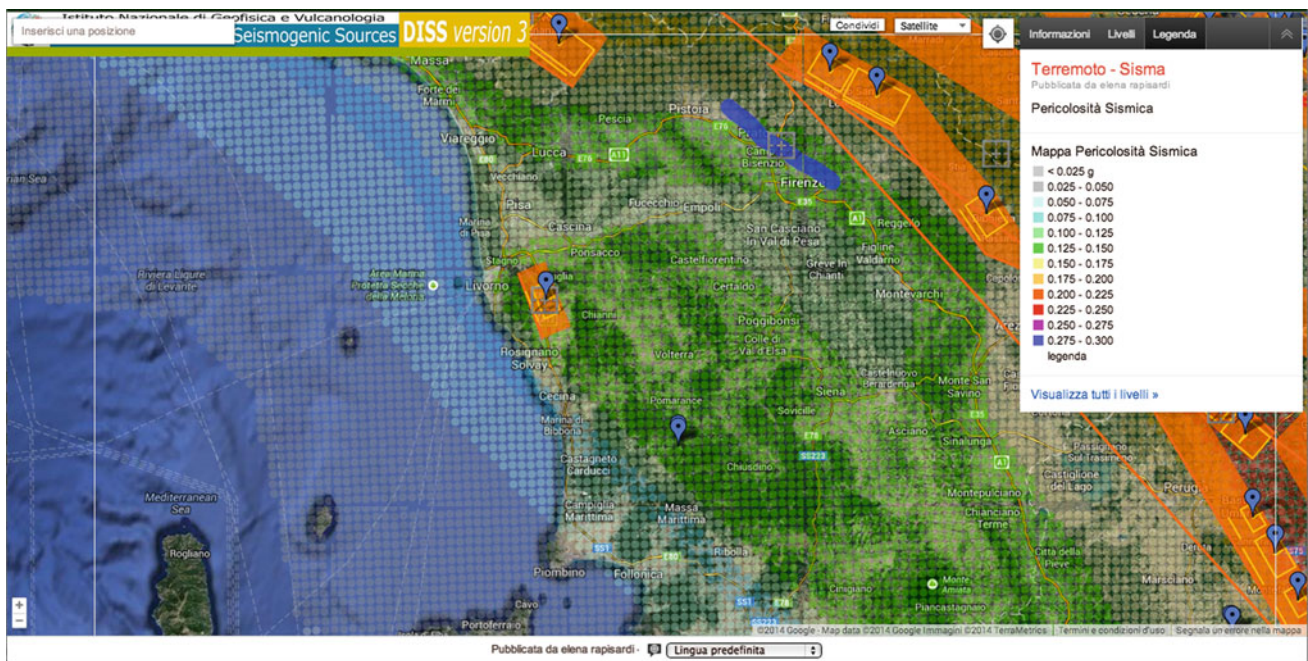
Fig. 34.2 Google crisis map civil protection—live maps http://goo.gl/2E0cgm and http://goo.gl/5LfUyl

models of collaboration between the stakeholders (institutions, responders, media, volunteers and citizens) envisaging the organization of a new interconnected volunteering, where rules of responsibility (rights and duties) are explicit and that could interact with spontaneous VTCs or bounded networks. (Rapisardi et al. 2013). Without any doubt if Italian Civil Protection would commit with a new model of Information Management, transparent, collaborative, and interoperable, should modify its information management process and acquire new competences and skills. Therefore, the issue to be discussed is not only the sustainability of the technological tools (e.g. proprietary vs OpenSource), or how to cope with the reduction of budgets, but "who" will be in charge to manage a new Information Management, how this new task will be included in the operational model, and how to better engage citizens spontaneous contributions. The information process is changing quickly calling institutions and public administration to a change. The rigidity of the institutional information flow should accept this new challenge, where the Web Information Management Process, understood as the flow of information between senders and receivers (internal and external, crowdsourcing, participatory), should become an essential, recognized and organized structure within civil protection system. In the Italian Civil protection framework this could be accomplished innovating and updating the communication function [F3],[8] as defined by the Method Augustus.[9]

Provided that the civil protection volunteering is well defined and protected by the law, an acknowledged and independent National Task Force (NTF) could be set up, on the basis of the experience and the best practices of SBTF or of the Digital Humanitarian Network (DHN),[10] but in the framework of national laws on volunteers associations. Including VTCs approach into the Civil Protection System should be done on condition that the Italian NTF is ruled under the same conditions of the other civil protection volunteers organization. During an emergency, the NTF, a *super partes* task force, could be integrated and supported by a local and spontaneous SBTF, but both VTCs should comply with a multi-skilled and multi-competent team schema: individuals from various disciplines and professions (e.g. geologists, engineers, GIS specialists, emergency managers, communication experts, web developers, web copywriters, law experts), whose skills and competencies are verifiable and tested. Such formalized, but flat, distributed and flexible team should also engage local and spontaneous teams, ensuring a full support to local bodies in managing information: structuring information and improving easy access, monitoring the web sphere and

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[8] See also http://www.slideshare.net/BBarsanti/crisiscamp2

[9] The method Augustus is a planning tool in the field of emergency adopted by the Department of Civil Protection of the Italian Republic.

[10] In 2012 SBTF, GISCorps, MapAction, Humanitarian OpenStreetMap Team (HOT), ESRI, Geeks Without Bounds, Translators Without Borders, Statistics Without Borders, Humanity Road and UN Online Volunteering Service, joined the Digital Humanitarian Network (DHN), launched by A. Verity, OCHA and P. Meier, iRevolution.

developing solutions and tools on the fly in order to respond to information demand from the public, to ameliorate situational awareness and to give support to spontaneous citizens participation (either VTC, or in the field). In this perspective, Information Preparedness, is a fundamental leverage to foster such a radical change in information management and processes, and should be embedded in the disaster cycle, by conceiving an overall web information strategy, supported by a clear and open organizational structure, based on collaboration, citizens engagement, participation, open knowledge and transparency.

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