Utilising Social Media Data for Enhancing Decision-Making during Emergencies

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Investigating the role of social media in crises and catastrophic events

OVERVIEW

- Objectives:
  - To explore new and emerging communication technologies and applications and provide an insight into the most effective ways to utilise them to promote the enhanced safety and security of citizens in crisis situations.
  - To assist better communication and information gathering for authorities and first responders.
  - To examine the potential roles and ethics regarding citizen participation in emergency response.
  - To produce guidelines that will assist authorities and first responders in deploying new and emerging communication technologies and applications to better protect citizens in crisis situations.
  - To disseminate the findings to wider audiences and to seek the opinion of stakeholders working in the field via two dedicated workshops.
- Duration: M1 (1 April 2013) – M24 (31 March 2015)
- Budget: 1 228 896 euros
- EC contribution: 997 040 euros

THE CONSORTIUM

	Participant organisation's name	Short Name	Country
1	European Dynamics	ED	Greece
2	Trilateral Research & Consulting	TRI	UK
3	Radboud University Nijmegen (Crisislab)	RUN	Netherlands
4	KU University	KU	Turkey
5	Hellenic Rescue Team	HRT	Greece
6	Public Safety Communication Europe	PSCE	Belgium
7	Safety Region South Holland South	VZHZ	Netherlands

Situational awareness: a prerequisite for effective decision-making

"the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future"
(Endsley, M.R., and Garland, D.J. "Situation Awareness Analysis and Measurement", 2000

During crises

A symbiotic relationship between RESPONDERS and THE PUBLIC: The authorities requested photographic/video material by the public after the 2013 Boston bombings and similarly after Hurricane Sandy in 2012

IMPORTANT ISSUE: Reliability of information collected in this way

Societal dynamics during crises

Citizens are rarely passive and strongly disposed towards helping victims
Individual, organisational and societal dynamics are largely dependent on the time it takes a crisis situation to develop and on its destructive effects; not necessarily on the type of crisis
The role of government in the immediate aftermath of a crisis situation is often limited

Citizens involvement

First responders – Journalists – Activists

Example: Haiti 2010

A July 2012 study demonstrated that real-time monitoring of Twitter messages in Haiti could have predicted the October/November 2010 cholera outbreaks two weeks earlier than they were detected. Anonymised data, shared by Digicel, demonstrated that population movements in response to the cholera outbreak began prior to official detection of the outbreak.

Deaths from cholera are preventable and outbreaks are more easily dealt with in their early stages. This means there was a lost opportunity to save lives.

While there is no way to arrive at a precise statistic, over 200 people had died by 23 October, four days after first detection, and 900 by 16 November. Overall, more than 6 000 people died and over 400 000 became ill.

Users of Twitter reported damage and other effects of the quake only a few minutes after the first shock
- *"It's really ugly, just like in a bad dream. people need help, get out and help ! #haiti @eq"*
- *Facebook*
- *YouTube, iReport Video)*
- *Skype*
- *TwitPic (Picture sharing service of Twitter)*

The contribution was acknowledged by relief agencies such as:
- *Red Cross (US)*
- *FEMA*
- *USAID*

Preparing for a crisis – Standard Operating Procedures (SOPs)

Tiered Structure of a SOP
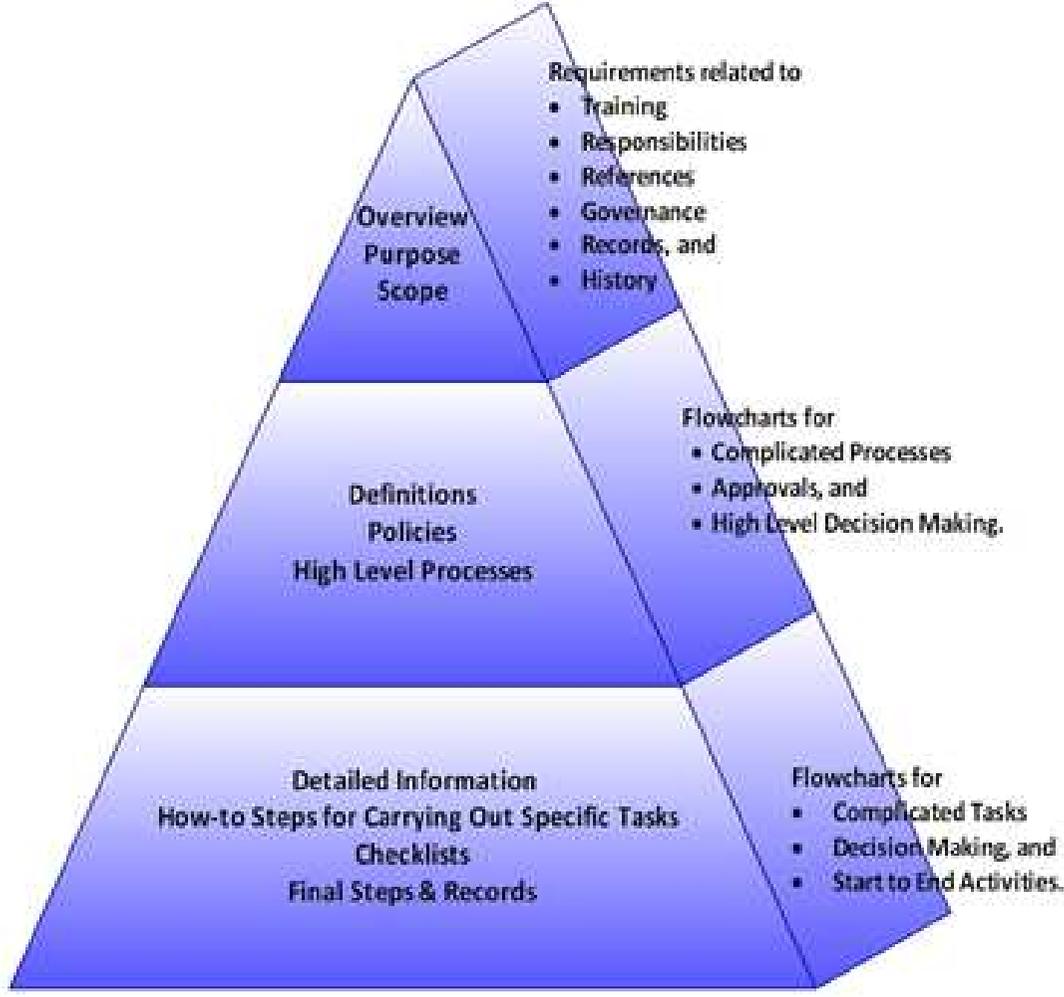
Are Social Media included in the SOPs of rescue organisations?

- *No references in guidelines at European level*
- *US FEMA: Annex R of its SOPs refers explicitly to digital and social media and to web-based and other interactive communication with the public. Article 5.0: "Social Media Monitoring and Reporting for Situational Awareness"*
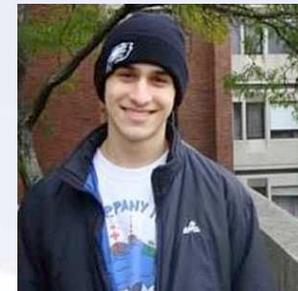
Weeden Marcia, "The Well Written SOP – Critical for Continuous Improvement", Writing Assistance Inc, http://www.writingassist.com/resources/articles/the-well-written-sop-critical-for-continuous-improvement

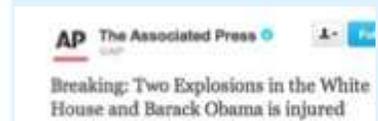# Adverse use of social media

Types of misuse

- **Misrepresentation**

- **Rumour**

- **Propaganda**

- **Surveillance and Censorship**

- **Lateral Surveillance**

- **Despite those, our findings show that social media contribute to the openness, fairness and speed of communication during a crisis**

Sunil Tripathi, Boston Bombings, 2013

> Submit a new text post
>
> **findbostonbombers**
>
> subscribe 1,254 readers
>
> ○ 1,884 users here now
>
> Any and all theories welcome, please make a new thread for each discussion - unless significant news comes out about a previous theory.
>
> **IMPORTANT:** We do not support any form of vigilante justice. We are not law enforcement. Worst case scenario, we send a tip to the FBI or BPD. Our goal isn't to independently make "them" pay.
>
> Boston FBI Email: boston@ic.fbi.gov
>
> created by oops777   a community for 12 hours

The search of the Boston bombing suspects on Reddit

> AP The Associated Press ○
>
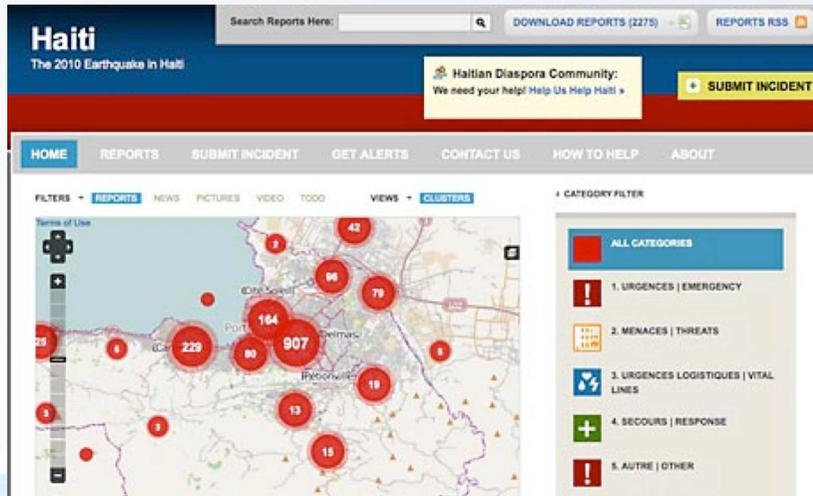> Breaking: Two Explosions in the White House and Barack Obama is injured

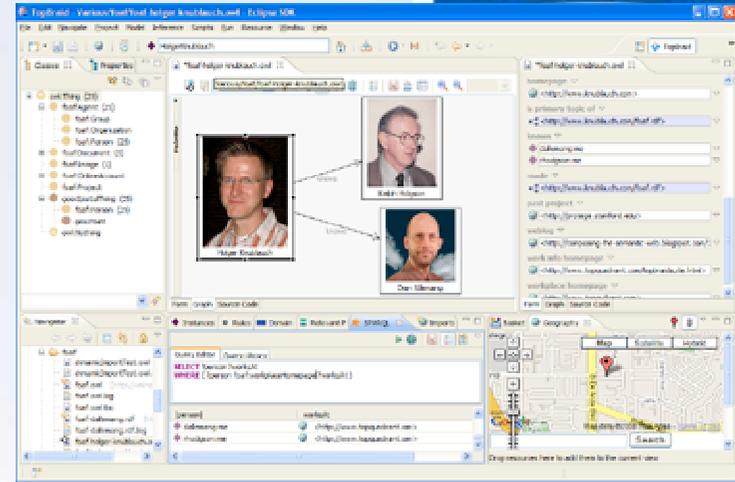*The Twitter post on the hacked AP account*

"Crowdsourcing: a new idea for innovating!"

But could it be also a new idea for exploiting volunteers, who respond to needs arising due to a major crisis, for private gain?
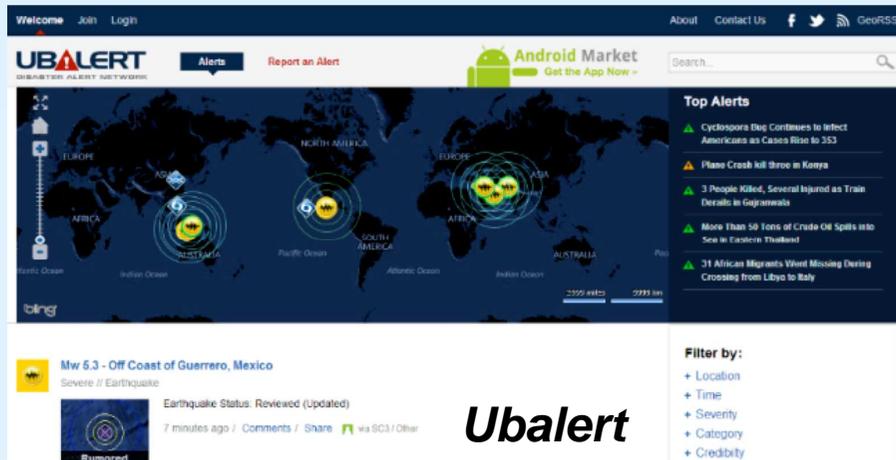
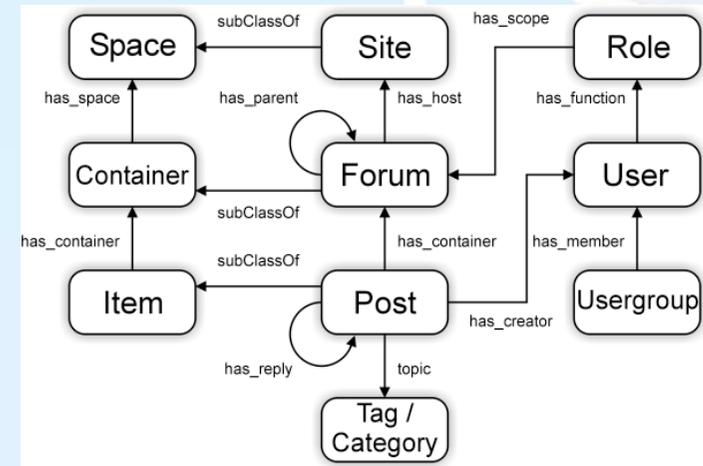# Verification techniques

Ushahidi

Screenshot from the FOAF based application Topbraid

Ubalert

Example of the SIOC core ontology (Source: W3.org)

Attempts on semantic models

- **FOAF Ontology - describes people and social relationships on the Web. Particularly well suited for describing people on web-based social platforms (facebook, twitter, blogspot, etc)**

- **SIOC Ontology - describes online communities such as forums, blogs, mailing lists, wikis; complements FOAF by focusing on the description of the products of those communities: posts, replies, threads, etc**

- **OpenSocial Data Specification - supports exploring the social graph and application development for social media applications; the most mature standards-based component model for cloud-based social apps**

- **The SocIoS Object Model and the SocIoS Ontology - core of the European project SocIoS on the semantic equivalence among social media networks; supports consistent operations (the SocIoS Core Services) to be performed on social media data, regardless of the Social Networking Site from which the data is drawn (cross-platform applications)**

Strategic use in crisis management

- **Our findings confirmed that social media:**
  - Provide help towards responders by completing the building of situational awareness
  - Are able to supply additional information, in particular at the first stages of a catastrophic incident, which can be decisive in attracting external funds and sponsoring and therefore enabling the participation of voluntary organisations (NGOs) such as the HRT
  - Can provide valuable information able to direct rescuers of survivors
  - Are a means of addressing the public concerning rescue efforts and other vital to life information

www.cosmic-project.eu

- Conference addresses
- Presentations of the project at 3rd party events
- Chapters in books
- Publications in academic and popular fora

COSMIC: FUTURE DIRECTIONS

Continuation of the project's work up to end of March 2015

- *Typical crisis evolution scenarios: among responders, among the public, between responders and the public*
- *Models and characteristics of crises*
- *Citizens' involvement in crisis communications – ethical issues*
- *Guidelines for the use of new communication media by the public and by responder agencies and bodies*
- *Future directions of research*

Workshops and conferences

- *Final international COSMIC conference – February 2015*

CONTACT

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Thank you!