# Emergency Information System

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## ABSTRACT

This paper describes an information system designed to be deployed in emergencies caused by sudden onset natural disasters. The aim is to streamline the communication flow and collaboration between media, aid workers and government agencies with the affected population, to help the latter get verified, accurate and actionable information that will enable them to make decisions and recover from the disaster.

The Emergency Information Service (EIS) system also provides means for affected population and field workers to channel vital data back up into aid response. This tool is part of a free information service run by Thomson Reuters Foundation to help survivors of natural disasters. It will serve the affected populations, local media and relief responders by providing fast, practical and verified information in local languages through the best means available.

### Keywords

Information management, disaster response, communication, collaboration, media, humanitarian aid.

## INTRODUCTION

Underlying EIS is the assumption that people caught up in disasters are not helpless victims and that life saving, actionable information is as important as blankets and tarpaulin. As first responders, they need reliable information to make decisions and minimize the impact.

'Information is a vital form of aid in itself […] Disaster-affected people need information as much as water, food, medicine or shelter. Information can save lives, livelihoods and resources.' (International Federation of Red Cross and Red Crescent, 2005)

## OBJECTIVES

In line with those assumptions, the design objectives have been to:

- Collect reports originated from the very first layer of affected population - survivors; combining that with information received from the field including aid agencies, local media and government.
- Provide fast and reliable means to filter, search and detect important information in the pool of reports.
- Streamline the flow of information inside a distributed editorial team including local translators.
- Reach out to affected population with useful and actionable information in a timely manner.

## WORKFLOW

The overall goal of the designed flow is to streamline the creation and maximize the availability of relevant and credible information to communities. This implies the creation and distribution of such information. The flow improves when people have not only direct access to information, but also the benefit of credible intermediaries to help discover, gather, compare, contextualize, and share information. (The Knight Comission, 2009)

**Reviewing Statement**: This paper represents work in progress, an issue for discussion, a case study, best practice or other matters of interest and has been reviewed for clarity, relevance and significance.

The flow in figure 1 can be divided in 4 stages:

1. Collection of raw reports from the field.
2. Filtering, processing and identification of important information.
3. Editorial process including verifying the accuracy of information, editing and translating the information into local languages.
4. Inform relevant stakeholders.

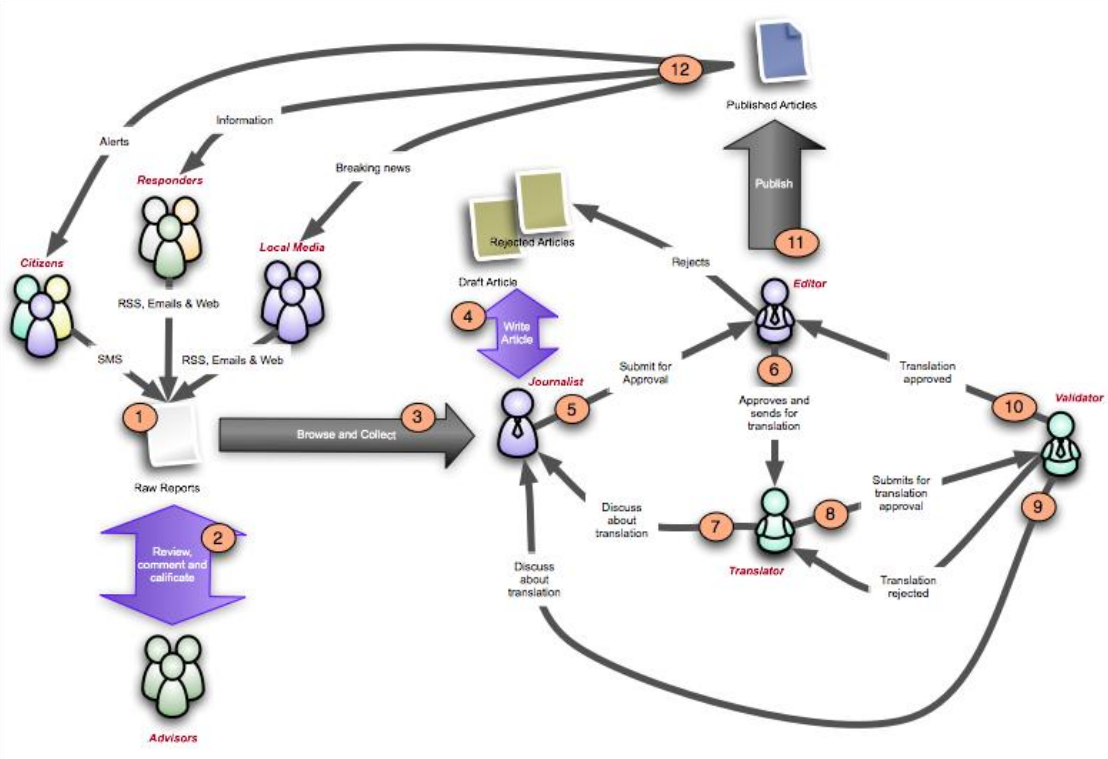


**Figure 1. Information workflow**

### Subscription and Collection

Citizens can report their location by sending an SMS to the system with the name of the village they are. That simple action registers them in the system to receive alerts targeted to that village.

Every citizen, either registered or not, can report information to the system through SMS.

The system allows submission of raw reports through several channels:

- SMS: through mobile aggregators (like Clickatell) or plugged-in phones. People can send information to a specific number, which then stores the message in the system.
- Email: any number of email addresses can be checked by the system and directed to specific collection baskets or inboxes.
- RSS: feeds can be checked periodically and new articles will appear in the system.
- Web: any user with permissions can post information using the web interface.

### Selection

Through a number of different tools, users monitoring the pool of raw reports can filter important information. The goal in this stage is to try to deal with as many situation awareness "demons" (Endsley, 2003) as possible, being data overload and stressors the most salient ones in these kinds of scenarios. These tools include search, tagging and automatic extraction of the location the text refers to. Other features that can be added to customize the experience and workflow include flagging documents, hiding them, commenting and relating them. The objective of these features is to aid in the process of collaboratively selecting useful information to initiate the editing workflow.

### Editing

A module called "Baskets" allows the configuration of a custom workflow tailored to the specific team and situation. The module works based on the concept of baskets. Each basket is a collection of pieces of information (items), that acts both as inbox and outbox. Each user in the system is given permissions to read, write, move in or move out items from one or more baskets.

Typically, a user would monitor one or more baskets based on his role. As new items appear, he will decide what to do, act on the item, flag it as urgent, write a comment, create a new alert or translate it to another language. He would then put the new item or the edited one in another basket for someone else to do his part of the job.

### Informing

Once an alert is ready to be sent out to relevant recipients, the system allows the user to target affected population by location through a map with references of clusters of citizens. The user sees a map with the different groups of citizens and the number of citizens in each group.

The objective of targeting by location is not only to keep the information relevant to everyone, but also to avoid that people in a desperate situation end up travelling to a distant location just because they received a message saying there is food or blankets there.

The alert can be sent through SMS and Email, and can also be addressed to specific working groups, like aid workers, local media or government agencies.

## TECHNOLOGY

The EIS system was built on top of RIFF (http://instedd.org/evolve), an InSTEDD platform tool developed as a general collaboration environment for content creation, social metadata annotation, and automated analysis with potential applicability in a wide range of areas.

## RESULTS

As of the moment of presenting this paper, the system was deployed with much success in Haiti:

- The population response was very high, getting more than 5.000 subscribers in less than 10 days. Currently above 15.000.
- More than 1.000 incoming SMS per day from the survivors, including emergencies, needs or information requests to a total of more than 50.000 messages processed inside the system.
- Several agencies, under the UN umbrella, are both receiving targeted information from citizens, and sending out messages regarding where to find food, register missing people, get shelter and health measures.
- More than 20 users from different agencies and groups.

Within hours of the earthquake, most of Haiti's cell phone towers were still operational and text messages were getting though in most of the country but Port-Au-Prince. After 2 or 3 days of work, the 2 main telephone companies could get most of the capital antennas back to work.

The EIS team was deployed less than 48hs after the earthquake and, in partnership with other organizations like Ushahidi and FronlineSMS:Medic, quickly began negotiations with the telephone companies to establish a shortcode for citizens to text-in and for the system to be able to send messages out. A diagram of the final ecosystem architecture of applications and organizations interacting around the shortcode and EIS can be seen in Figure 4.

More at: http://www.alertnet.org/db/blogs/1564/2010/00/24-120746-1.htm

A recent pilot of the system in Tomohon, North Sulawesi Indonesia, in partnership with the Local Red Cross and the Search and Rescue Team, has proved the validity of our assumptions. Even if the incoming stream of reports from the field contained (by design) a low signal/noise ratio, the editorial team managed to process the information, select relevant topics and going through a quick but reliable loop with local translators could provide alerts with verified data.

A short summary of the pilot can be seen at: http://www.alertnet.org/thefacts/reliefresources/125907780276.htm

## CONCLUSION

We have built and tested in a real disaster scenario, a tool that can handle information collection, manage information flow and provide means for reach out to survivors in a wide range of disaster situations, providing the support for channeling information up and down as needed among a heterogeneous ecosystem of stakeholders. The system will serve as the basis for further learning, development and work on the subject.

## ACKNOWLEDGMENTS

We would like to thank to all the people that worked in the inception, design, development and testing of the system: Monique Villa, Timothy Large, Astrid Zweynert, Joanne Tomkinson, Thin Lei Win (Thomson Reuters Foundation); Eric Rasmussen, Robert Kirkpatrick, Eduardo Jezierski, Luke Beckman (InSTEDD); Juan Wajnerman, Brian Cardiff, Martín Verzilli, Ary Borenszweig, Andres Taraciuk, Mariana Galvan, Martin Scebba (Manas Technology Solutions).

The help and feedback of the Palang Merah Indonesia (Indonesian Red Cross) was essential to conduct the pilot and improve the system.

A special thank to Willie Smits who hosted us and helped us with the logistics in North Sulawesi.

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