Voice-enabled ICTs for effectively managing crises

THE CHALLENGES:

Under a well-developed disaster management system, the Sri Lankan National Disaster Management Centre (DMC) should be aware of and should map every significant emergency incident or risk in the country, down to the level of something as minor as a broken village bridge caused by a landslide. The local road maintenance authority would issue an alert about the broken bridge to local disaster management, police, health and other authorities. This would prepare all coordinators for emergency events. Health authorities would know not to dispatch an ambulance over that bridge to pick up someone about to have a baby. Local disaster authorities would be prepared to avoid that route in an evacuation event.

Such effective rescue and relief coordination among multiple agencies require:

1. Access to near real-time situational-awareness information for swift and accurate allocation of emergency response resources
2. Mobilizing Community Emergency response Team (CERT) members with localized and easy to use ICTs voice-based that do not require computer literacy and English language skills
3. Standardizing and localizing emergency data to better integrate multiple national systems for content and business interoperability

We tested several tools that can be used by government agencies to meet these challenges.

SUMMARY OF FINDINGS

MULTI-AGENCY SITUATIONAL-AWARENESS TOOLS, such as the standardized free and open source Sahana software integration with the Freedom Fone Interactive Voice Response (IVR), can foster an easy to use and useful platform for sharing emergency information.

INTEGRATED DATABASE OF INCIDENT INFORMATION: Integrating the Sahana software with the, DMC, call centre and IVR services would result in a database of incident information. Such a database may also be leveraged as evidence for climate change adaptation policy.

THE RESEARCH

Voice-based interfaces can better facilitate emergency communication, especially in developing countries, by leaps and bounds, opposed to traditional keypad entry data communication systems. Telephone calls are the main mode for communicating emergency
information between the Sarvodaya Shramadhana Movement\textsuperscript{1} community-based emergency coordinators and their central incident management hub in Sri Lanka. With it's footprint in 50% of the villages in Sri Lanka, governing structure, and development scope similar to that of a national system, piloting the voice-based emergency information exchange system with Sarvodaya can be easily extended to a government agency such as the DMC. Sarvodaya CERT members were introduced to an IVR with procedures to receive localized voice alerts and send incident reports of field observations.

The Freedom Fone\textsuperscript{2} Interactive Voice Response (IVR) and the Sahana\textsuperscript{3} disaster management system integration was field tested with Sarvodaya CERT members in Colombo, Matara, Nuwara-eliya, and Ratnapura Districts. The pilot project\textsuperscript{4} revealed that the technology marriage was an easy to use and useful combination for CERT members to exchange information with the central incident command centre, namely the Sarvodaya Hazard Information Hub (HIH) in Moratuwa.

![CERT Perceived IVR Ease-of-Use and Usefulness Mean Score (scale 1.00-5.00)](image)

**Figure 2:** CERT members perceived ease-of-use and usefulness of FF for alerting and situational reporting

The CERT perceived ease-of-use and usefulness are illustrated by the bar chart in Figure 2. The indicated scores for each District are the average of ease-of-use and average of usefulness are on a scale of 1.00 (low) to 5.00 (high).

To visualize the CERT perceived comments on the usefulness and ease-of-use in achieving their goals, those comments were run through Wordle to rank statistically significant words. Figure 3 shows the the Wordle output. Key words from the output are: **FF (Freedom Fone IVR), system, incident, exchange, instructions, quickly (quick), flexibility, accurate, simplicity, connect, consistency.**

![Wordle analysis of the CERT members' qualitative responses](image)

**Figure 3:** Wordle analysis of the CERT members’ qualitative responses

**CONTACT**

2 Freedom Fone free and open source software website: [http://www.freedomfone.org/](http://www.freedomfone.org/)
3 Sahana Software Foundation website: [http://www.sahanafoundation.org/](http://www.sahanafoundation.org/)
4 Feasibility study to enable Freedom Fone with voice-based Emergency Data Exchange project page: [http://www.lirneasia.net/projects/2010-12-research-program/ff4edxl/](http://www.lirneasia.net/projects/2010-12-research-program/ff4edxl/)