

Brief Introduction and description of project/s

As Community Emergency Response Team (CERT) members for Sri Lanka's largest humanitarian organization, Sarvodaya primarily use voice telephony for communication. LIRNEasia conducted a feasibility study to integrate Sahana Eden with Freedom Fone to provide a voice-enabled emergency management system for alerting and situation reporting. Standardized alerts generated through Sahana were localized and disseminated to targeted CERT members through Freedom Fone. Freedom Fone also provided an Interactive Voice Response (IVR) interface to gather and disseminate field observation (or incident) reports. The solution was evaluated by approximately fifty Sarvodaya CERT members who found it to be useful and usable. The project was made possible through a grant from the Kubatana Trust of Zimbabwe.

What worked - and why

- Using a Voice interface to Sahana Eden meant that the system did not rely on literacy in latin script and computer skills and was easy for the CERT members to adopt. Only 8.75% of the users found this to be difficult (or complex) to use and 84.31% completed their voice activities in a single or couple of attempts.
- Sahana Eden supports interoperable emergency content standards with the Emergency Data Exchange Language (EDXL) Situational Reporting (SITREP) and Common Alerting Protocol (CAP). Sahana Eden's web services and data transforms make it easy to integrate with other systems.
- The solution adds more structure to and records communications which were previously ad-hoc, informal and unaccountable.

What didn't work - and why

- Currently the solution relies upon information being manually transferred between Freedom Fone and Sahana Eden at the Hazard Information Hub (HIH), which is confusing to operators as they have 2 different interfaces. Most of the procedures for transferring information between the two disparate systems or for one software to trigger an event of the other could very well be automated. These shortcomings were systematically studied and presented in the form of a technical report, which will be leveraged by the Freedom Fone and Sahana communities in their venture to further improve the integration for reliable and acceptable emergency communication.
- Automatic Speech Recognition and Text to Speech transformations are unreliable at their present stage of development; especially for large vocabulary continuous speech, generally practiced in emergency communication.
- Unlike computer or mobile applications that display the transition state on the screen, IVRs do not provide a visual of the transition states to the user. Therefore, determining the application's transition history was not intuitive. Moreover, the CERT members had forgotten how to reverse their actions to traverse back to the previous menu. Instead, they terminated the call to make another one. An implementation policy may be to ensure that the menu tree does not branch more than three nodes; i.e. first is language selection, second is application, third is the function (e.g. Sinhala → Reporting → Leave a message).
- Unbranded cheap phones did not always interact well as some keypad entries were not recognized.

Recommendations

- Sahana Eden should become the single front-facing application for users and this should talk to the IVR via application programming interfaces (APIs). The APIs should allow for dynamic real-time interfacing with all functions: structuring menus, uploading audio files to the menu tree nodes, accessing "leave-a-message" audio files, and controlling outbound dialing. The Freedom Fone and Sahana Eden communities are currently discussing how this could be done.
- The workflows could be further streamlined with better use of default values, specific naming conventions and help content embedded in the software to reduce users' reliance on the printed manual.

NOTES

During all exercises the HIHO were constantly referring to the quick reference guide to determine the next steps. Such steps should be streamlined with software controls. Default values and naming conventions were another cause to constantly refer to the guide. Help content should be provided in the software with quick reference pop-ups or suggested values.

2) FF must be unbundled such that the Operating System (i.e. Linux Debian – Ubuntu), Freeswitch (GSM gateway), http server, and GSM modem can be installed and configure separately.

3) As Sahana disaster management system will be the front end to the users, FF will function in the capacity of a back-end service where Sahana will interface with FF through a set of application programming interfaces (APIs).

The FF

5) Allow for passive and active delivery of voice messages; i.e. passive being user calls to access the message and active being FF calls the user to deliver the message

(1) Voice IVR allows public participation beyond the reach of the literate (& English-script literate)

(2) We have piloted (with CERT LK) having public phone in incident reports which then get added to Sahana

(3) Pilot showed that this process needs much tighter integration between IVR & Sahana to be easy enough to use to make part of std business processes

(4) Sahana & Freedom Fone have an active dialog on the best way to make this happen

Hazard Information Hub @ Community Disaster Management Center, Moratuwa, HIH Manager, 3 HIH Operators

Four Districts: Colombo, Matara, Nuwara-eliya, Ratnapura, ~ 10 - 13 CERT members from each district: Divisional/District Coordinators, Staff

Outbound calls: Text To Speech easy

Inbound Speech To Text is harder:

- o Trained system limits users
- o Untrained system limits quality
- o Voice quality not enough

Extend to Assessments?

LIRNEAsia with support from the Kubatana Trust of Zimbabwe.

Read more: <http://lirneasia.net/projects/2010-12-research-program/ff4edxl/>

Nuwan's:

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Sri Lankans, and Asians in general, are accustomed to telephones calls more so than text-based messaging modes. To that end, the voice-enabled emergency communication study, involving the interconnection of the Freedom Fone Interactive Voice Response (IVR) and Sahana disaster management systems, investigated the complexities, usability, and utility of the coupled system. The principal was Sri Lanka's largest humanitarian organization: Sarvodaya. Telephones calls are their predominant choice for emergency communications. The study was carried out with approximately fifty Sarvodaya Community Emergency Response Team (CERT) members from four diverse administrative Districts and Sarvodaya personnel at the Hazard Information Hub (HIH) (located near the capitol: Colombo). Despite technical difficulties the solution proved usable and useful; moreover, Sarvodaya CERT members had a positive attitude towards using the system. The project was made possible through a grant from the Kubatana Trust of Zimbabwe.

What worked - and why

Aims and objectives that were met adequately - how were potential, or real, obstacles overcome or resolved, for example.

Given that the Freedom Fone IVR is unrestricted by language and does not require computing skills the solution was easy for grass-roots level CERT members to adopt. There were two components that the project exercised: 1) alerting CERT members of a disaster and 2) processing field observation (or incident) reports. Sahana worked in the capacity of managing the categorical disaster information and Freedom Fone was the interface between Sahana and the CERT members. Standardized alerts generated through Sahana were localized and disseminated to targeted CERT members through the IVR. Thereafter, CERT members recorded the field observations in the IVR, which were processed by HIH staff to generate Sahana situational reports for deriving response resources.

The work flows were evaluated through a series of controlled exercises. The concept was proven to be effective for enabling the last-mile communities with crisis information exchange.

What didn't work - and why

Aims and objectives that weren't met adequately - why were potential, real and unaccounted for obstacles difficult to overcome, for example.

What lessons can be drawn from this/lessons learnt.

Bullet pointed summaries with short explanations

The Sahana and Freedom Fone systems, in their decoupled state, were complex for the HIH staff to interact with. The HIH staff had to switch between the two systems that caused a certain level of confusion. Most of those procedures of transferring information between the two disparate systems or for one software to trigger an event of the other could very well be automated. These shortcomings were systematically studied and presented in the form of a technical report, which will be leveraged by the Freedom Fone and Sahana communities in their venture to further improve the integration for reliable and acceptable emergency communication.

Recommendations