

**International Federation of Red Cross and Red Crescent Societies (IFRC)**  
**Case Study: Two-Way SMS Communication with Disaster Affected People in Haiti**  
**Prepared for CDAC Network Media and Tech Fair, March 2012**

## **The Need for Communication**

On Tuesday 12 January 2010, at five o'clock in the afternoon, a massive earthquake struck Haiti. It left over 300,000 people dead and more than one million people homeless. More than three million were affected in some way. The earthquake also caused a massive dislocation of communities.

The International Federation of Red Cross and Red Crescent Societies (IFRC) realised that an effective method of two-way communication with disaster affected people was needed. Radio and TV broadcasts, posters, leaflet distribution, loudspeaker trucks and face-to-face discussions were all used. However, it was quickly realised that more was needed. Mobile technology seemed the obvious answer as a high proportion of Haitians own mobile phones.

In times of disaster, a mobile network comes under great stress. Parts of the network may have been damaged. Survivors are also desperate to locate loved ones and to let others know that they are safe; their calls cause congestion. In fact in Haiti, one network, acting under the very best of intention, gave free credit to its customers to help them to do this. The result was extreme network congestion which made it impossible for most people to get a connection and gave the impression that the network had failed.

Clearly a method was needed that provided effective communication without causing stress on the mobile network.

## **SMS Text Messaging**

The IFRC decided to base its mobile communication system on SMS text messaging. There were a number of key reasons for doing this:

- SMS is a basic mobile service and should be available on any GSM network
- It will be one of the first services to be restored in case of network damage
- It uses the minimum of network resources
- SMS text messages are stored on mobile phones, enabling recipients to 'run and tell' others who either don't have a working mobile phone or who are connected to another network

## **Key Challenges**

### **SPAM and Fraud**

Many aid agencies responded to Haiti's need for help. Most of these also recognised the power of SMS messaging to reach the population. This resulted in a deluge of requests for help from the mobile operators for free SMS broadcast. The mobile operators were quick to help but a number of problems resulted.

One of these was that many agencies sent out very similar messages. For example, during the cholera outbreak, multiple messages were sent advising people to 'wash their hands'. This caused a 'spam effect', reducing the attention that recipients paid to these kinds of messages generally.

Some requests for help had actually come from fraudsters representing themselves as aid agencies. The mobile operators, not knowing any different, had granted them SMS broadcasts. Some of these broadcasts were then used for advertising goods for sale. In the worst cases, messages telling disaster affected people that they had to pay money to receive Red Cross aid were sent out.

### **Network Issues**

The sending of multiple SMS broadcasts also caused network issues. Many of the mobile phones targeted were not available as they had either been lost or were without power. The networks were therefore hit with large numbers of SMS messages which could not be delivered. This resulted in network congestion and loss of service.

### **Targeting**

Broadcasting to the entire population is a very clumsy method to use. If, for example, you are running a vaccination programme, you do not want to have the whole population turning up at once. You may also want to send messages about services in a specific area; another challenge for SMS broadcast.

### **Commercial Network Issues**

The mobile network operators themselves have concerns about the effect that the help that they provide might have on their business. Key issues include:

- Loss of revenue due to network capacity use
- Effect on relations with the rest of their customer base
- Commercial secrets including information on their customers and network infrastructure.

### **Response Time**

It took some time to get communications properly up and running in Haiti. It was quite clear that the early days were the most critical.

### **The TERA Approach**

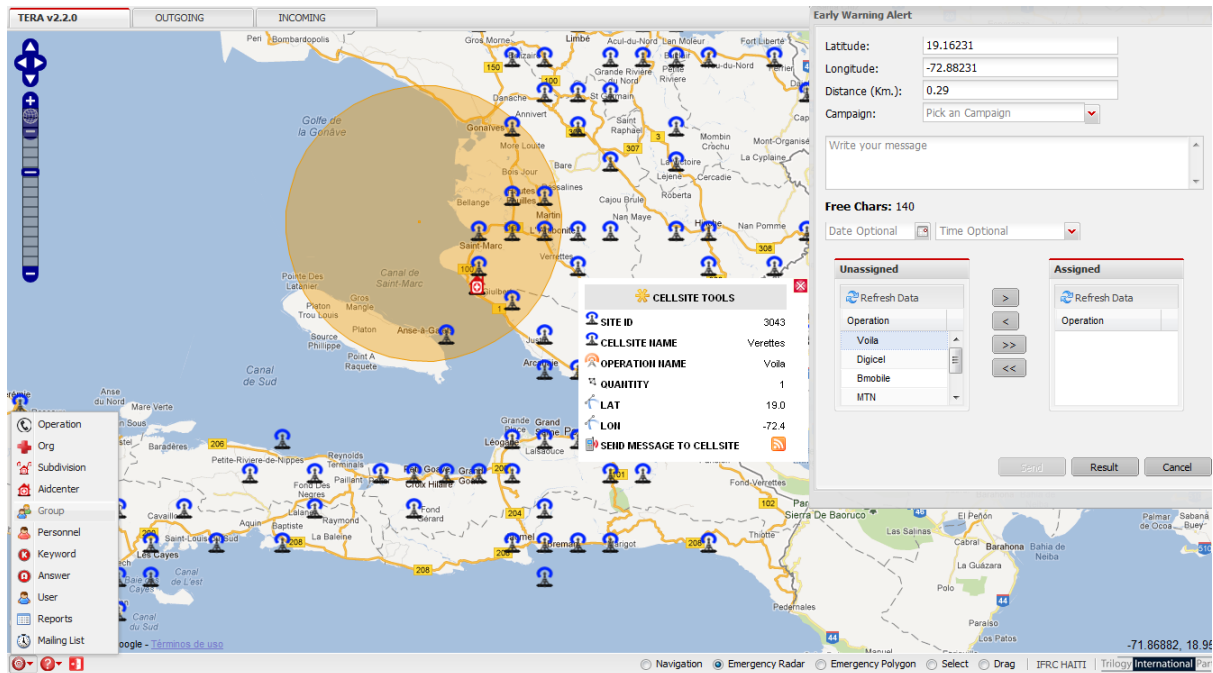
To address the issues discussed above, the IFRC worked in conjunction with one of the local operators, Voila. Voila is owned by the Trilogy Group. This collaboration meant that the resulting Trilogy Emergency Response Application (TERA) system not only achieved Red Cross objectives, but, because Trilogy has had experience of running several mobile operators, did so with the minimum of impact on the host mobile network. TERA implements a number of key features:

#### **1. Active Subscriber Recognition**

The system 'learns' which mobile handsets are switched on and ready to receive messages. This allows TERA to only send messages to 'live' handsets, reducing the number of undelivered messages and subsequent congestion.

#### **2. Geographic Targeting**

TERA also learns which cell site tower each subscriber is connected to. This information is used to allow TERA operators to send messages to people located in specific areas. It means that the demand for individual services can be controlled. It also means that messages are kept relevant to the recipients, reducing the 'spam' effect.



### 3. Fuzzy Keyword Recognition

The system examines incoming messages to look for keywords. These allow for various spellings. When a keyword is recognised, the system can respond with a pre-prepared message. This allows for high volumes of messages to be managed. In Haiti, a campaign on cholera generated 300,000 SMS messages – far more than could have been managed using a manual system.

### 4. Traffic Throttle

TERA is always under the control of the mobile operator. The operator can, at any time, stop operation. TERA also offers the operator a throttle which restricts the number of messages that can be sent. This reassures the operator that TERA will not interfere with its commercial operations.

### 5. Opt Out

TERA offers any recipient the opportunity to opt out of receiving messages. There is also a black list capability that allows operators to exclude specific ranges of numbers. This avoids upsetting non-affected subscribers of the network.

### 6. Multi-National Operation

The TERA system can be operated remotely by a trained Red Cross team. The system is designed to allow regional control centres to operate the system via remote secure link. This means that communication can be effective immediately following a disaster. The system can even, with appropriate approval from the authorities, be used to issue warnings in advance.

## Lessons Learnt

There are a number of basic lessons which have been learnt through this project.

### Pre-Positioning

The system needs to be in place before a disaster strikes. Otherwise valuable time is lost.

### Demands on Mobile Operators

Operators in Haiti reported that they were 'besieged' by requests for help from aid agencies. They have no idea which ones were valid and which not. Some turned out to be fraudulent. Some agencies behaved

irresponsibly once they had been granted access to the network. A lot of spam resulted, causing a reduction in the effectiveness of aid messages and in the annoyance of the operator's customer base. Ideally the mobile operators would like to deal with just one agency for message sending. The IFRC is looking into the possibility of offering a gateway service for other agencies.

### **Message Timing**

The middle of the night is off-peak for SMS traffic. However, it is not a good time for sending messages. An SMS message at this time wakes people up and causes great worry as it may mean that a family member has been kidnapped.

### **Trust**

There were many cases of fraud in Haiti. Perhaps amongst the worst were people claiming that disaster affected people had to register with them and pay money in order to receive aid. The message source needs to be trusted. Ideally this trust needs to be established in advance of any disaster.

## **Recommendations**

### **Global Roll Out**

The IFRC will roll out TERA to, initially, the 10 most disaster prone countries world-wide and ultimately at least 40 countries. These systems should be controlled from regionally located centres with trained staff in place. Roll out should be completed as soon as possible.

### **Inter-Agency Co-Operation**

Other agencies should consider the feasibility of cooperation with the IFRC over SMS communication with disaster affected people. The Mobile Operator community, through its trade body the GSMA, has clearly expressed the desire to deal with a single agency in the event of a disaster. TERA could potentially be used as the portal for all aid agency SMS based communication with beneficiaries. This would simplify life for mobile operators, rendering them more willing to help, reduce the opportunities for fraudsters, and also minimise message repetition.