

Cell broadcasting for public warning: Our work in the Maldives

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Public warning in the Maldives

- An island nation composed of groups of 26 atolls of about 1,192 islets of which 250 islands are inhabited
 - A public warning system must be able to reach a highly dispersed population in all of the inhabited islands
 - All inhabited islands covered by mobile; more than 100 active SIMs per 100 people
- At peak, tourists amount to 1/5th of the population
 - Tourism is primary industry
 - Value in giving tourists peace of mind while on vacation
- Suffered the greatest property losses per capita in the 2004 Indian Ocean tsunami

Public warning in the Maldives

- Radio/TV can be sent warning through dedicated TETRAnet or otherwise, but for warning to be received, sets have to be turned on and the link to transmitters not fail
- Satellite radio was an option (scored high in HazInfo field trials), but WorldSpace is no longer in business
- Tourists unlikely to be tuned to local TV/radio channels, or even have the sets turned on
 - All tourists resorts have mobile coverage and at least some tourists are likely to keep their handsets on

The answer is mobile

But what form? Cell broadcasting or SMS?

Cell broadcasting (CB) is . . .

- The technological ability to send a single text or binary message to multiple mobile phones within a cell
- Originally designed to let network operators offer location-based services
- It is a standard feature on GSM networks as well as on IS95 CDMA networks
- Essentially, it is a timely and efficient means of pushing out a message to an entire cell area without the lag times associated with SMS, which are queued
- It is a **one-to-many mode of communication**, unlike SMS, which is in essence a one-to-one mode
 - Therefore, immune to congestion

| Short Message Service (SMS) | Cell Broadcast (CB) |
|--|---|
| Messages sent point-to-point (messages directed to handsets) | Messages sent point-to-area (messages directed to radio cells) |
| Requires input of recipient phone numbers | Does not require input or knowledge of numbers |
| Only pre-registered numbers notified | All numbers within a cell notified |
| Effective within normal mobile coverage area | Because the return signal from the handset is not required, effective over a much larger area especially over water. |
| Messages cannot be differentiated by location of recipients | Messages can be differentiated by cells or sets of cells |
| Subject to congestion and thereby, delay | Being broadcasts, not subject to congestion |
| 140-160 characters in length. Can concatenate up to five messages | 93 characters. Can concatenate up to 15 'pages' to produce a single message of up to 1200 bytes of data |
| No indication that message is generated by a legitimate authority | Not possible for outsider to generate a cell broadcast so greater authenticity |

CB when there is no imminent disaster . . .

- Cell information
 - Switched on in many countries, but not in Maldives when study was conducted
- Advertising
 - Advertisers can have own channel (60,000+ logical channels available)
 - Subscription options must be available
- Mobile banking
- Event management
- Service and airport information

CB in other countries

- May 2005, **South Korea** became first country to use CB for public warning
- October 2005, **the Netherlands** became first country in Europe to *require* all operators to transmit government text warnings via cell broadcasts
- Since November 2007, NTT DoCoMo in **Japan** is offering Alert Mail, a CB service that provides warnings for earthquakes and tsunamis
- **USA** is developing a Commercial Mobile Alert Service (CMAS) in ATIS (GSM and UMTS standardization) and TIA (CDMA standardization)
- January 30, 2009, Dialog Telekom together with the Disaster Management Centre (DMC) of **Sri Lanka** launched the island's first ever mass alert warning system; the 'Disaster and Emergency Warning Network' (DEWN)
 - Emergency cell broadcasts will initially be done over the default Channel 50, but eventually dedicated emergency cell broadcast channels will be in place so that trilingual messages (Sinhala, Tamil and English) can be sent

Recommendations to the government of the Maldives

- Adopt CB for public warning in the Maldives
 - Networks must switch it on
- Participate in ITU-T Study Group 2 discussions to advance standardization of CB channels
 - Until then, conduct discreet campaign to get tourists to switch on the channel used in Maldives
- Allow use of cell broadcasting for advertising, event information, tourist information, etc.
- Explore the compatibilities of m-banking with the cell broadcast technology

Technology is only a part of the answer

- Need to work on protocols for communicating authoritative warnings and alerts from government authorities to telecom operators
 - Standard formats
 - Periodic drills
- Essential to get hotels and coastal communities to think through disaster response plans
 - Training and certification
 - Periodic refreshing of knowledge through drills or table-top exercises
 - Funding must be worked out

Box contributed by LIRNEasia to *World Disasters Report 2009*, pp. 29-30

Box 1.4 Peace of mind for a tourist paradise

In the Maldives, located in the Indian Ocean south of India, some 300,000 people live on 200 of the 1,200 small islands which make up the country. The densely populated capital Malé is home to one-third of the population. This atoll nation is the wealthiest in the region with a gross domestic product (GDP) per capita of US\$ 2,992 and more mobile phone connections than people (Maldives Government, 2008).

Tourism is the single most important industry, contributing around 27 per cent of GDP. Some 92 of the uninhabited islands have been converted to resorts that attract upmarket tourists, whose numbers amount to more than one-fifth of the country's population during the peak winter season. According to the Asian Development Bank, the Maldives was among the countries worst affected by the 2004 Indian Ocean tsunami. Loss of life was small, but about

A recent United States Federal Communications Commission Order on public warning mobiles found SMS to be unsuitable and indicated that operators should instead use point-to-multipoint capabilities of networks. This is the only viable method at the present time. Since handsets incapable of delivering public warnings will have to carry notifications, this has turned the tide among manufacturers and operators in favour of CB.

In consequence, the Telecommunications Authority of the Maldives (TAM) requested LIRNEasia, a regional telecom policy and regulation think tank with expertise in disaster warning, to identify the preconditions necessary for the use of CB for early warning and to evaluate its potential for commercial application. The biggest barrier was found to be lack of knowledge. In the tiny but intensely competitive



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Mobile messages could aid early warning in the Maldives

Tharaka Gamage
18 August 2009 | EN

[COLOMBO] Texting short messages through mobile phones could help in early warning of natural disasters in the Maldives, says a new report.

The technology, called cell broadcasting, helps to deliver messages simultaneously to multiple users in a specified area.

"In the case of the Maldives, if an early warning is introduced, it must be able to reach all of the outlying islands including tourists on resorts. With mobile phones quite ubiquitous, it may be an ideal time to introduce an emerging technology — cell broadcasting — for public early warning," says



Damage caused by the 2004 tsunami
Flickr_Tsunami Maldives

- Information Services**
- RSS (what's this?)
 - Webfeeds
 - Feedback

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