Technology Initiative for Disaster Management - Case study of Sri Lanka

Mothilal de Silva - General Manager Corporate Planning, CSR, MIS and Quality Systems
Dialog Telekom Limited, Sri Lanka.
ITU/ESCAP REGIONAL WORKSHOP ON “DISASTERCOMMUNICATIONS”
Bangkok, Thailand, 12 – 15 Dec 2006
Content

1. Introduction
2. Dialog Initiative – DEWN
3. Technology of DEWN
4. Progress
5. Achievements
1. Introduction
Dialog Telekom Ltd (DTL) in a nutshell

- Flagship telecommunication provider in Sri Lanka.
- Most profitable company in Sri Lanka.
- Market Leader in terms subscribers and revenue. 2.9 Million Mobile Subscribers or 15% penetration and holding a market share of 60%.
- 900+ base stations covering 80% of population and 65% landmass.
- Limited WCDMA and HSDPA coverage.
Dialog Leveraging For the Community

- SMS 112 for the benefit of Hearing Impaired –

- Blood 7777 – Invented and architected the solution of Blood Donor Registration and Donor Matching Program Via SMS

- Digital Bridge – Connecting resource starved rural schools to central hub in Colombo, mainly to facilitate technology based education in English Medium using Video Broadcasting

- Change Trust Fund – Innovative Billing Solution to get subscriber participation for charitable initiatives

- Dialog – University Of Moratuwa Mobile Communication Research Laboratory – to facilitate R&D on Telecommunication in Sri Lanka and enhance applied research skills of Sri Lankans.

- DEWN – Disaster and Emergency Warning Network
The Devastation in Sri Lanka – An overview

• Sri Lanka is one of the two countries that were hardest hit by the Tsunami Tidal Waves that wrecked havoc on several countries in the Indian ocean Rim on December 26, 2004.

• Over 35,000 lives were lost with several more unaccounted or missing and 0.5 million rendered homeless and injured.

• Disrupted livelihoods is a silent killer post Tsunami in most areas and have caused many psychosocial issues in the affected areas.
The Devastation in Sri Lanka – An overview

• Education and schools disrupted and severe damage inflicted on basic facilities. Health services disrupted and extensive environmental damage. Infrastructure along the coastal belt was destroyed.

Fishing and tourism sectors in particular were hardest hit. Extensive damage was also caused to railway and road networks on the periphery of the coast.
The Devastation in Sri Lanka – An overview

• Cost of damage to infrastructure due to the Tsunami in Sri Lanka estimated at US$ 3 Billion.

It is estimated that the anticipated growth rate of GDP in 2005 will have to be revised downward by about 1% (from 6.5% to 5.5%).

The limited impact on the macro economy is due to the fact that together the most affected sectors of the economy (fisheries and tourism and related services) contribute only 3% of GDP.
Dialog Telekom’s Tsunami Relief and Rehabilitation Programme is built on the creation of the 1 Million USD (Rs 100 Million) Network of Life (NOL) Fund.

The activities of the NOL encompassed three phases of the overall rehabilitation challenge.

- The short term (immediate medical and other therapeutic assistance for the injured and homeless)
- The medium term (Psychosocial assistance in the North and South of Sri Lanka)
- The Longer term (reconstruction of affected areas)

Dialog Telekom Limited also provided immediate and spontaneous relief to the Government of Sri Lanka (GoSL), relief agencies and the armed services
2. Dialog Initiative - DEWN
Why did Dialog initiated DEWN?

An Early Warning the need of the hour. A costly awakening to the fact that the Nation needed a reliable disaster warning mechanism to reach her citizens.
What are the Challenges of a Disaster Warning Network?

An instant warning which would be:

- Effective in alerting citizens at day or night
- Immune to Communication Network Congestion
- Comprehensible in terms of local dialect
- Directed to specific location or person or equally applicable for mass dissemination
What are the Challenges of a Disaster Warning Network?

And overriding reliably reliable in terms of authenticity and validity of prompted action.

In the context of Sri Lanka and other developing countries in the south Asian region, wide and effective reach no doubt translates to

- Affordability
- Accessibility
- Familiarity
- Availability

Dialog TELEKOM

A TM Company
Can GSM be the “Communication Lifeline” in case of a Disaster?

Could GSM fill that critical need for an intelligent but ubiquitous delivery mechanism for national disaster warning?

GSM in Sri Lanka

• Reaching over 5 Million Sri Lankans
• It has the omnipresent; 70% of landmass and 85% of the population
• Ubiquitous in terms of availability
• Affordable to all the segments
• Messaging capabilities are unmatched by any other

The answer is clearly …… YES
Dialog initiative

**YES**

January 2005

Dialog Telekom initiate R&D on Disaster and Emergency Warning Network (DEWN)

DTL's Long term contribution to the National effort to prevent loss of life in future emergency situations

Can GSM be used to save lives?
Joining with our partners......

**Microimage**

Microimage (Pvt) Ltd.

**Dialog**

Dialog-University of Moratuwa Mobile Communication Research Laboratory

**Ministry of Defense**

Disaster Management Center

Dialog TELEKOM

A TM Company
Dialog – University of Moratuwa Mobile Research Lab

- The first of its kind in Sri Lanka, the laboratory, which specializes in Applied Mobile Telecommunication Technologies Research, and was set up as a part of DTL’s social investment towards uplifting and facilitating research & development and higher learning in Sri Lanka.

- Applied research projects and product development initiatives, that providing provision for technology transfer with similar research bodies.
- are beneficial to the industry, and are academically challenging are undertaken by the laboratory, whilst
- New ideas in wireless communication, which encompasses the spheres of designing, prototyping, testing, and training, are explored, with the objective of developing new products and services that will serve the purpose of taking Sri Lanka to the forefront of mobile technologies, thereby ensuring Sri Lanka’s place in the challenging and evolving world of mobile technology.

- The rewards of this initiative manifested itself through the recent
  - Disaster and Emergency Warning Network (DEWN) developed in this laboratory, and launched in November 2005.
  - Development of the Sri lanka’s first learning network “ Digital Bridge “
3. Technology of DEWN
Technologies Used

Can **GSM** be used to save lives?

**R&D on GSM Family of Tech**
- Cell Broadcasting
- LBS Tech
- Java/Symbian/Microsoft
- SMS

**Network Based**  **Device Based**
Technologies Used

Network Based

- DEWN
  - SMS for limited/selected recipients
  - Cell Broadcast for mass alerting even under conditions of network congestion
  - Location based cell broadcast and location directed SMS

Delivery methods

DEWN

Unique delivery methods to close the loop between dissemination and effective interpretation

Device Based

Handset resident application
Translated SMS and CB messages into Screen Flashes and Audible Alarm

Handset resident applications
Tri-lingual form encompassing Sinhala and Tamil

2.5G GSM DEWN Alarm Device
High volume alarms
Interfaces to domestic devices (TV, Radios, alarms, temple/church bells, Loudspeaker systems)
Key additional functions of DEWN

Development focus of

**DEWN**

- Network Operation Centre technologies
- Requisite administrative controls
- Process technologies

**Addressing...**

- Message Authenticity verification and multiple key verification
- Anti-Spam protection
- Database technologies for location, group or individual directed messaging
- SMS/Voice based call back
- Administration and Control front end for centralized management.
JAVA/Symbian/Microsoft Handset

» Terminal resident warning application
» Customizable and situation specific presentation
» Downloadable over GPRS at no cost
» Special Alarm Tone

Microimage

Dialog TELEKOM
GSM DEWN Alarm Device

The GSM activated remote alarm is an electronic device that can be used for emergency warning purposes.

- Multiple wake up measures
- Power source compatibility
- A Back up power - up to 10 hrs standby
- Multiple alarm interfaces (TV, Radio...)

Dialog TELEKOM

A TM Company
Cell Broadcast and Mass Alerts

Dispatch of messages to the masses at an instant within a geographic area

Geographic area is controlled via the BSCs and Cells where the broadcasting will take place
4. Progress of DEWN Implementation
Pilot Implementation of DEWN

Directed Alerts
Application installed in relevant stakeholder handsets.

stakeholders
Police Hierarchy
Village Headman
Government Agent
Monk/Religious Leader
Chief Medical Officer
Hospital Administration
Pilot Implementation of DEWN

**Directed Alerts**
Centralized database, which collates relevant individuals

**Features**
Acknowledgement of receipt
Return delivery of status updates

**Delivery**
SMS
Cell broadcast messages

**Mass Alerts**
Similar Operation to directed alerts

**Features**
Differentiation of cell broadcast message
Location based CB using LBS

**Delivery**
Cell broadcast

_Dialog TELEKOM
ATM Company_
Pilot Implementation of DEWN

Directed Alerts
Application installed in relevant stakeholder handsets.

stakeholders
Police Hierarchy
Village Headman
Government Agent
Monk/ Religious Leader
Chief Medical Officer
Hospital Administration
Pilot Implementation of DEWN

Directed Alerts
Centralized database, which collates relevant individuals

Features
Acknowledgement of receipt
Return delivery of status updates

Delivery
SMS
Cell broadcast messages

Mass Alerts
Similar Operation to directed alerts

Features
Differentiation of cell broadcast message
Location based CB using LBS

Delivery
Cell broadcast
Local Hierarchy

Context specific selective warnings are disseminated based on a local hierarchy.

SMS or CB

SMS or CB

CB

Recipients are equipped with either GSM handsets, GSM remote devices or both.
- Instant Alerting
- Mass and Directed Dissemination
- Wide Availability
- Affordability
- Applicability and effectiveness
- Reliability and authenticity
- Scalability

Breaking new ground...

DEWN
Going forward...

Applicability of DEWN in other disaster situations

Flood
Dam Burst
Epidemic
Forest Fire
Bomb Explosion
Chemical hazard
Overview of progress in 2006

- Signed MoU with Disaster Management Centre (DMC)
- Currently conducting pilot testing in locations across the country with DMC
- Planning for national implementation underway
- DEWN is being tested with 3 other disaster warning systems in the IDRC funded Last-Mile HazInfo Project (Project is conducted by Sarvodaya and LirneAsia. Evaluation results will be published and presented internationally.)
- Filed for local patent
Improvements to DEWN devices and system:

- Modified DEWN system to be compliant with ‘CAP’, the international alerting protocol.
- Incorporated Cell Broadcasting (CB) message capability
- Improved DEWN alarm system (addition of radio tuner, and upgrading of components)
5. Achievements
Publications

Magazines

- Nokia ‘New Horizons’ Magazine
  (February 2006)

- National Science Foundation Magazine
  (March 2006)

And many more…
Pilot Implementation of DEWN

“Lessons learnt in Sri Lanka could be applied to cities like New York or London in the event of a chemical spill or a terrorist attack.

Some 3.5 million of Sri Lanka’s 19 million people have a mobile phone, but to reach a wider number the system will also use alarms linked to the mobile phone network that will trigger sirens or bells in police stations, churches and temples in the event of an alert.”

Peter Apps
Reuters Foundation, 14th November 2005
Awards and Recognition for DEWN in 2006

National Best Quality Software Awards – 2006
Gold Award in the Research and Development Category
Overall Gold Award for DEWN at NBQSA 2006

The National Awards for Science and Technology – 2006
Award for Excellence in Multidisciplinary Research & Development

GSM Asia Mobile Innovation Awards
Short-listed - Innovative Technology Development Award

Asia-Pacific ICT Awards
(Short listed)
International and national Recognition for Dialogs CSR Efforts

**2001 GSM World Award** for the idea behind the Change Trust Fund initiative, a unique system where Dialog post-paid customers are given the opportunity to donate half a percent (0.5%) of their monthly bill up to a maximum of SL Rs. 25/= with the company matching the contribution, which would be used for charity.

**2002 GSM in the Community Award** on Wireless Accessibility for SMS 112, a SMS based emergency call facility for the hearing and speech impaired.

**2003 GSM in the Community Award** on Best Use of Wireless in Emergency Situations for Dialog’s blood appeal, matching and donor management system.

**2006 - DEWN** International and national Recognition for Dialog’s CSR Efforts
Thank you

Mothilal De Silva
E-mail:mothilal@dialog.lk
Mobile:+94 777331122
Tel:+94 777087607
Fax:+94 112302411