

## **PART III**

# **TECHNO-DARJEELING**

## Implementation of Cell Broadcast in Hill Region

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### Abstract

The paper explains about the 'Cell Broadcast' and how it is helpful for the Emergency Alert Notification. It is a mobile technology where a message can be delivered to many mobile handset users. The purpose of this paper is to make people aware of the Emergency Alert Notification through the Cell Broadcast facility presently available and thus in the future to alert the people and help save their lives and livelihood.

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**Keywords:** Cell Broadcast (CB), Base Transceiver Station (BTS), Cell Broadcast Center (CBC)

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### Introduction

All knowledge is for the welfare of mankind. In today's world technology plays an important role. From home to office and everywhere we can see the effect of technology. The term technology sounds incomplete without the term mobile which is one of the more recent and popular technologies in the world. When we talk about a mobile we come across the term, SMS, Voice Call, Video Chat, Internet etc. Likewise, there is one more facility which is termed as Cell Broadcast, an application, that is part of mobile technology.

TV, Internet, Radio, Telephone, Pager, Fax are the basic means of communications in our day to day life. However, considering the possible and frequent power failures the above devices fail to provide effective communications. The most reliable communication device seems to be a mobile. Even though power fails for an hour or day, still it helps to communicate, depending upon battery backup - provided there is no network failure. Now you might be wondering what Cell Broadcast means and what it actually does.

### What is Cell Broadcast?

Cell Broadcast (CB) is a mobile technology feature defined by ETSI (European Telecommunications Standard Institute) and GSM (Global System for Mobile) committee and a part of the GSM standard. It is also known as Short Message Service-Cell Broadcast (SMS-CB). Cell Broadcast is designed for simultaneous delivery of messages to multiple users in a specified area. Whereas the Short Message Service-Point to Point (SMS-PP) is a one-to-one and one-to-a-few service (requires multiple SMS message, as each message can only carry one phone number), Cell Broadcast is a one-to-many geographically focused messaging service.<sup>1</sup> The technology is very useful and essential for *Emergency Alert Notification*.

1 URL: [http://en.wikipedia.org/wiki/Cell\\_Broadcast](http://en.wikipedia.org/wiki/Cell_Broadcast) (accessed on 22/Apr/2012).

## How does it Work?

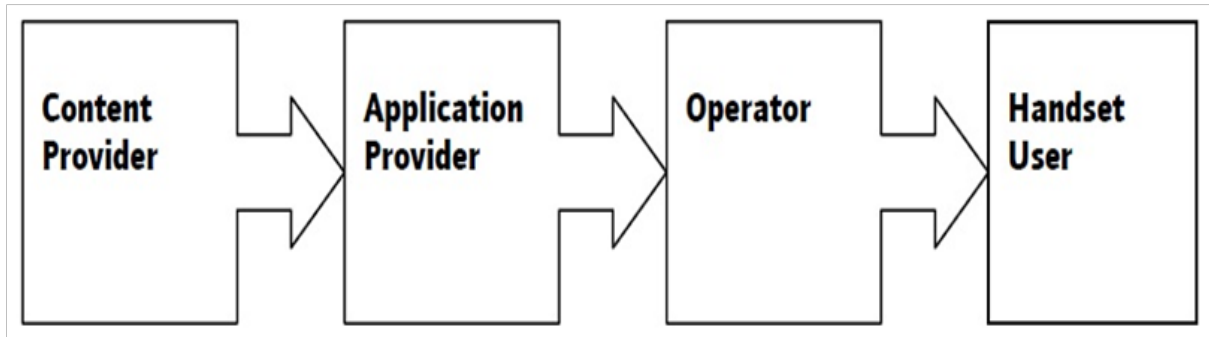


Fig 1: Cell Broadcast Service Value Chain<sup>2</sup>

First we need ‘Content Provider’: one who provides the content or message to be delivered, in fact a source. The content provider also pays for the Broadcast service and it can be anyone either the business person or a government body, who actually wants to broadcast a message.

Secondly, we have ‘Application Provider’ which is a party that formats the message to be delivered. The Content Provider pays for the service that an Application Provider provides.

Thirdly, an ‘Operator’ which is the party that is mainly responsible for the broadcast. It actually provides a network or channel through which messages are delivered to the end user, typically a mobile handset, that receives the message coming under the network coverage of the operator.

Last but not the least there is ‘Handset User’ on whom the entire cell broadcast concept focuses on. It is the terminal where messages are actually delivered. In order to receive the message delivered from the operator, the Handset User must keep his/her phone ON and along with that s/he must set the cell broadcast facilities in a phone. Over here we are not discussing about the technologies used in Cell broadcast, but only how it works.

2 URL: <http://www.cellbroadcastforum.org> (accessed on 23/Aug/2012).

COMPARISON OF EMERGENCY NOTIFICATION ALTERNATIVES						
	Safe & Secure	Reach 100% of population	Geo Specific	Existing equipment	Database Free	Timely
Cell Broadcast	YES	NO But there is a very high penetration of mobiles	YES	YES	YES	YES Millions can receive message in 20secs.
Landline Dial Up	NO Anyone can make phone calls	NO Can't reach visitors or travellers	YES	YES	NO	NO Speed limited by number of phone lines
Wireless Dial Up	NO Anyone can make phone calls	NO But there is a very high penetration of mobiles	NO You only know where person registered	YES	NO	NO Speed limited by number of phone lines
SMS	NO Anyone can send an SMS	NO But there is a very high penetration of mobiles	NO You only know where person registered	YES	NO	NO Speed limited by network capacity
Email	NO Anyone can send an email	NO But there is a very high penetration of email	NO Emails can be retrieved from anywhere	YES	NO	NO You cannot control when emails retrieved
Fax	NO Anyone can send an email	NO Not many people have fax	YES	YES	NO	NO Speed limited by number of phone lines
TV/Radio	YES	NO Can't reach travellers	NO	YES	YES	YES
Signage	YES	NO Not everyone is in sight of a sign	YES	YES	YES	YES

Table1: Shows the comparison for different media for emergency notification worldwide.<sup>3</sup>

The above table shows different devices for various communication methods. Analyzing the above table we can predict that Cell Broadcast is one of the best and reliable methods for communication when one needs to communicate to hundreds of devices at once.

Having looked into what cell broadcast is, how basically it functions and how reliable it is as compared to other devices, below are a few real applications around the world where the cell broadcast has provided its utility in real life, especially in today's fast world.

<sup>3</sup> Paul Klein, "Cell Broadcast: It Fits The Purpose", White Paper, URL: <http://www.cellcastcorp.com> (accessed on 23/Aug/2012).

### Example 1:

Example 1: Illustrates how a message broadcasted will be displayed in a simple phone. It shows how Cell Broadcast technology is useful for Emergency Alert Notification. In a mobile phone the message is displayed as: Tornado will impact your current location in 18 minutes. Take immediate shelter inside on the lowest floor. Further info AM 50 FM 105 TV 4.

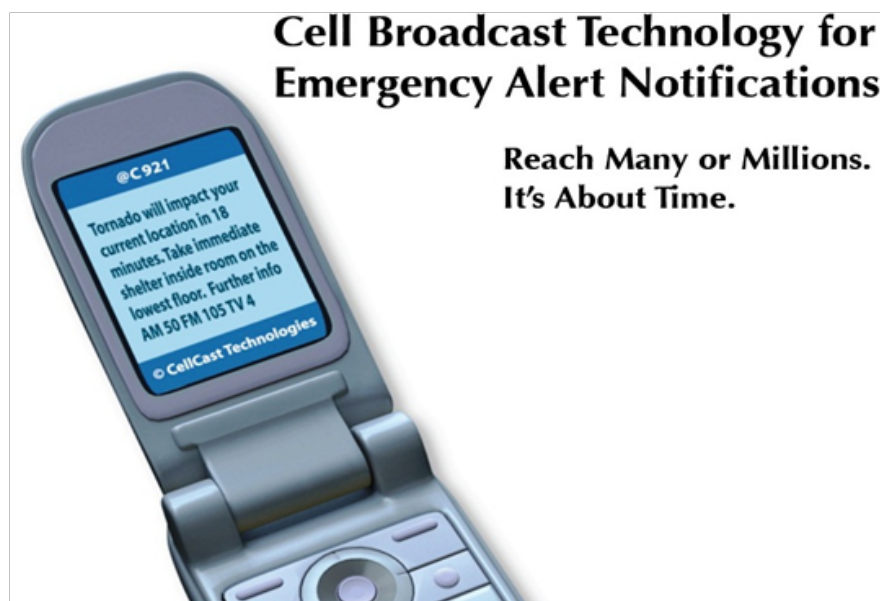


Fig 2: Cell Broadcast Technology for Emergency Alert Notification.<sup>4</sup>

### Example 2:

*The Wall Street Journal* published a report entitled "Murder, She Texted: Wireless Messaging Used to Fight Crime" by Liyuan.<sup>5</sup>

The Hague, in the Netherlands, got a report that a boat had been stolen. They sent out a text message about the case to residents who had signed up to receive neighborhood crime alerts on their cellphones. An hour later, a woman bicycling along a canal who got the message notified police via a phone call that she saw a boat that met the description. The boat was found and the thief arrested. "They're the eyes on the street" says a spokesperson for The Hague's police department.

In the above context i.e. *Example 1* we saw how the message was cast for tornado which reads "Tornado will impact your current location in 18 minutes. Take immediate shelter inside on the lowest floor. Further info AM 50 FM 105 TV 4". It is an Emergency Alert Notification or Pre Alert Notification. There are various other examples in the world where the people of the particular geographical location have been alerted for

<sup>4</sup> Picture taken from Cell Broadcast: It Fits The Purpose White Paper by Paul Klein

<sup>5</sup> URL: <http://www.wsj.com> dated July 2, 2007.

impending natural disaster. The cell broadcast technology is not only applicable for the Emergency Alert for natural disasters but also can be applicable for controlling the crime in any region and in any corner of the world provided the broadcast facility is available as seen in **example 2** where The Hague's police department were able to control a crime. With reference to the above two examples we can analyze, how effective cell broadcast can be. Other than that we can use these facilities for various purposes like tourist information, advertising, stock market, parking, and traffic control and railway information by broadcasting the messages as to, for example, why the train is delayed. It, in short, gives an idea as to the scope of cell broadcast service.

### **Cell Broadcast in Hill Region**

Two major problems that people of Hill Region often face are landslide and especially in rainy season power failure because of heavy rainfall, and sometimes in winter because of snowfall. As the Hill Region is in the base of Himalayas, in past few years people of the region have frequently experienced major earthquake and have lost several lives and their livelihood because of natural disasters. Other than that they have even experienced the Cyclone Aila on 27th May, 2009<sup>6</sup> and earthquake on 18th Sept. 2011.

'Darjeeling': A day after turning south Bengal into a lump of twisted mass, cyclone Aila travelled north and triggered torrential rain and landslides in the Darjeeling hills, killing 17 people and taking the statewide toll up to 64.<sup>7</sup> The people of Hill region have already experienced the natural disasters like, earthquakes, landslides and cyclone Aila. In such a case, people can be alerted using cell broadcast technology informing of potential disaster that may affect the place in certain time and mobilize them to take certain precautions. Darjeeling - "The Queen of Hill" - often experiences snowfall. During the time of snowfall, as the roads will be covered by snow the chances of accidents increase. In such a situation people can be warned about the snowfall so they could take necessary precaution.

### **Performance**

According to the GSM standard, Cell Broadcast messages can be sent every 1.883 seconds. The CBC must distribute the message to all the required BTSs. The performance is limited by the network as well as by the CBC itself. For example, 40'000 BTSs can be addressed in about 30 seconds. If 15 Million subscribers in the entire network have activated their Cell Broadcast channels 500'000 subscribers can be reached per second. It requires 500 high performance SMSCs to match these figures, if SMS messages were used instead.<sup>8</sup>

6 "Aila batters Darjeeling hills" - Deep Gazmer, *TNN* May 27, 2009, 05.13am IST.

7 URL: <http://articles.timesofindia.indiatimes.com> (accessed on 28/May/2009).

8 Advantages and Services Using Cell Broadcast issued by Cell Broadcast Forum

### **Future of Cell Broadcast**

There is no predictability about natural disaster as anything may happen anytime. It is the responsibility of oneself to be aware of such things and take due precautions as it is known that prevention is always better than cure. Cell Broadcast is a backup of backup. If power fails then at least mobile phone works for a day on an average. In such a situation Cell Broadcast can help people immensely. Cell Broadcast can alert people in case of emergencies. SMS is 'point to point' service whereas Cell Broadcast is 'one to many'. Especially through cell broadcast we can alert millions of people about the upcoming incident. As the number of mobile subscribers are increasing day by day, to reach every user at a time in real time, Cell Broadcast seems to be one of the better ways. The Cell Broadcast Center is shifting slowly to 'must have' from 'nice to have' element in an operator's network.