



Project number:	European Commission - 033685	
Project acronym:	CHORIST	
Project title:	Integrating <u>C</u> ommunications for <u>e</u> nhan <u>c</u> ed <u>e</u> nviron <u>m</u> ental <u>r</u> isk management and citizens safety	
Instrument:	Integrated Project	
Thematic priority:	Information Society Technology	
Call identifier:	FP6-2005-IST-5	
Start date of project:	01/06/06	Duration: 38 months

Deliverable reference number:	SP3.D18		
Deliverable title:	Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC)		
Version:	1.1		
State within Consortium:	DRAFT:	- FOR APPROVAL:	- APPROVED: X
Due date of deliverable:	MONTH 30 (11/08)		
Actual submission date:	25/05/09		
Lead contractor of this deliverable:	VODA SPMM		
Other contributing contractors:	None		

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
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PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
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CONTENTS

1	INTRODUCTION.....	3
1.1	PROJECT SCOPE.....	3
1.2	PURPOSE OF THE DOCUMENT.....	3
1.3	DOCUMENT VERSIONS SHEET.....	3
2	REFERENCE DOCUMENTS, DEFINITIONS AND ABBREVIATIONS.....	4
2.1	REFERENCE DOCUMENTS.....	4
2.2	DEFINITION.....	4
2.3	ABBREVIATION.....	4
3	EXECUTIVE SUMMARY.....	5
4	CELL BROADCAST MANAGER.....	6
4.1	INTRODUCTION.....	6
4.2	DEPLOYMENT OF THE CELL BROADCAST MANAGER.....	6
4.3	THE INSTALLATION PROCESS.....	6
4.4	RECORDED DATA.....	8
4.5	THE USER INTERFACE.....	8
4.6	CONTENTS OF THE CELL BROADCAST MESSAGES.....	10
4.7	CELL BROADCAST MESSAGES IN BARCELONA.....	12

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
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1 INTRODUCTION

1.1 PROJECT SCOPE

The CHORIST project will propose solutions to increase rapidity and effectiveness of interventions following natural hazards and industrial accidents, in order to enhance citizens' safety and communications between rescue actors.

1.2 PURPOSE OF THE DOCUMENT

This document describes the Cell Broadcast Manager project and its software deliverable, the Cell Broadcast Manager phone application, which records and logs the received cell broadcast messages together with their relevant data, making it possible to know for certain that a cell broadcast message is received in a certain GSM cell and a certain time.

In addition a description is given of the software development project, the used techniques, tools, platforms and software languages used. Also the Cell Broadcast Manager phone application is described including the installation process, the functionality and the reporting aspects.

1.3 DOCUMENT VERSIONS SHEET

Version	Date	Description, modifications, authors
1.0	23-04-2009	SPMM initial setup
1.1	8-05-2009	SPMM

Table 1 : Document versions sheet

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
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2 REFERENCE DOCUMENTS, DEFINITIONS AND ABBREVIATIONS

2.1 REFERENCE DOCUMENTS

- [1] 3GPP TS 23.041, Digital Cellular Telecommunications System (Phase 2); Technical Realisation of the Short Message Service Cell Broadcast (SMSCB), version 7.0.0
- [2] SP3.D7 Personal Communication Networks Gateway technical specification

2.2 DEFINITION

Broadcast	A transmission to multiple, unspecified recipients.
BTS configuration data	Coordinates and, optionally, geographical area that is covered.
Cell broadcast area	Geographical area(s) to which messages are broadcast. Cell broadcast areas may comprise one or more cells or entire PLMN. (See "Area")
Cell broadcast message	Message sent from the MD through the CBC to the PLMN. (See "Message")
ETSI	"European Telecommunications Standards Institute".
ETSI-compliant BSC	BSC which complies with standards as defined by ETSI.
Message Dispatcher	Sends messages to the CBC.
PLMN-wide	The message code and/or update number must change in the next cell for the message to be new.

2.3 ABBREVIATION

3GPP	Third Generation Partnership Project
BSC	Base Station Controller
BTS	Base Transceiver Station
CB	Cell Broadcast
CBC	Cell Broadcast Centre
CBS	Cell Broadcast System
CID	Cell ID
ETSI	European Telecommunications Standard Institute
GSM	Global System for Mobile communications
LAC	Location Area Code
MCD	Message Creator & Dispatcher
MCC	Mobile Country Code
MNC	Mobile Network Code
PLMN	Public Land Mobile Network
SMSCB	Short Message Service Cell Broadcast

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
---	--

3 EXECUTIVE SUMMARY

During the actual trials and demonstrations of the Chorist Cell Broadcast channel of communication, the demand for a Cell Broadcast monitor, at a location where CB messages are being transmitted has been defined, to complete the detailed insight of the functioning of the whole chain.

To test this a prototype mobile phone application (Cell Broadcast Manager) is developed which is able to show the Cell Broadcast messages on the screen of the mobile phone, with the time of reception, the message content, the LAC and the GSM CID (Cell ID) where the message is received.

In order to be able to use the cell broadcast network for alarming purposes in case of natural hazards or industrial accidents we have to be certain that all cell broadcast messages sent to a certain GSM cell are received on time and with the correct message content by all phones in the same GSM cell.

In this document a detailed description is given of the Cell Broadcast Manager development project and its resulting application, the Cell Broadcast Manager.

Aspects which are dealt with in this document are the techniques and tools used in the software development project, the functionality of the application, the target phones, its reporting methods and installation process.

The functionality of the Cell Broadcast Manager contains the following highlights:

1: The Cell Broadcast Manager application records the reception of cell broadcast messages in the GSM cells of the mobile network.

2: The Cell Broadcast Manager runs on a large number of mobile phones.

This makes it possible to know for certain if and when cell broadcast messages are broadcasted and received in certain cells.

The application shows relevant data, like cell id and used GSM cell broadcast channel, of the received cell broadcast messages at the moment of reception. The content of the received message is stored in a file for later inspection. At the moment of reception of a cell broadcast message an audio tone can be played in order to get the attention of the user.

When the cell broadcast network is used for alarming purposes in case of natural hazards or industrial accidents this application is believed a useful addition to the management and monitoring of the total Cell Broadcast Communication to Citizen Network chain.

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
---	--

4 CELL BROADCAST MANAGER

4.1 INTRODUCTION

The purpose of the Cell Broadcast Manager is to record the correct reception of a cell broadcast message in a cell of the GSM network. The reception of the cell broadcast message is shown on the screen of the application together with the time of reception, the local area code and the cell id.

4.2 DEPLOYMENT OF THE CELL BROADCAST MANAGER

The Cell Broadcast Manager is written in C++ and can be deployed on all Symbian Series 60 third edition phones.

The application is distributed as a Series 60 installation file and can be downloaded either directly on the phone via wireless Internet or via the PC.

After installation the phone has to be configured to use the GSM network and enabled for cell broadcast reception. This is a configuration option which is described in the user manual of the phone.

When the application is started it will record all received cell broadcast messages for all cell broadcast channels.

4.3 THE INSTALLATION PROCESS

The installation process consists of a number of steps.

- The installation file has to be transferred to the mobile phone. This can be done using Nokia PC suite, the application described in the chapter about the development process.

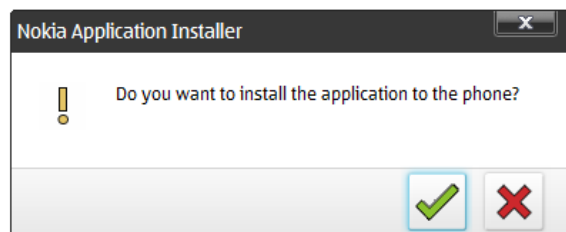


Figure 2: Nokia PC Suite on the PC at the start of installation

- On the mobile phone the following screen is shown

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
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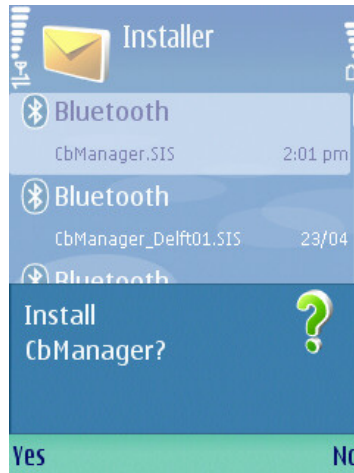


Figure 3: The install CBManager dialog

- After pushing the yes button an information dialog is shown

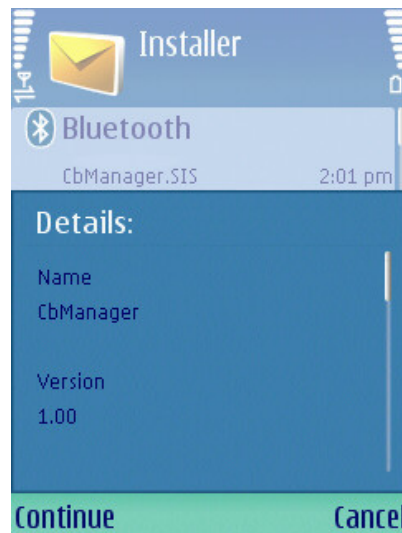


Figure 4: The Details dialog

- After pushing the continue the application is installed.

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
---	--

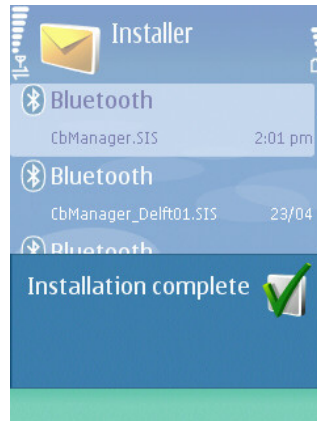


Figure 5: Installation is complete

4.4 RECORDED DATA

At the reception of the cell broadcast message the following data are recorded:

The cell broadcast channel over which the cell broadcast message is received

The date and time the cell broadcast message is received. The accuracy is in seconds.

The Location Area Code (LAC) in which the message is received

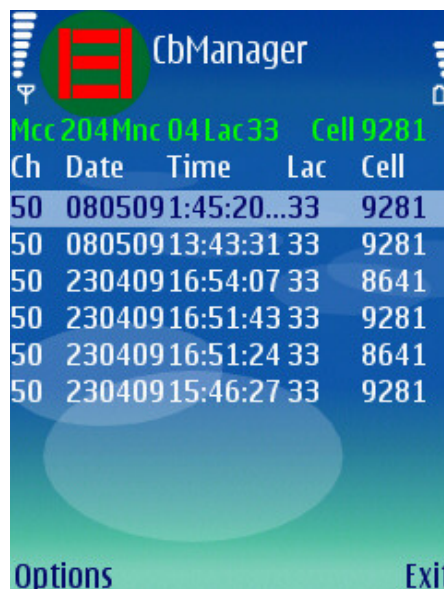
The Cell id. in which the message is received

The contents of the message.

Also recorded are the Mobile Country Code (MCC), Mobile Network Code (MNC), the LAC and the Cell Id. to which the phone is connected to. This information is refreshed each 10 seconds.

4.5 THE USER INTERFACE

After starting the application the following screen is shown.



Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
---	--

Figure 6: The main screen

The first row shows the data of the network to which the phone is connected.

The second row gives the following headers:

Ch channels

Data date of reception of the cell broadcast message.

Time time of reception of the cell broadcast message.

Lac location area code in which the message is received.

Cell Cell id. in which the message is received.

The application can be configured such that a tune or melody will be heard when a cell broadcast message is received. This tune or melody can be different per channel.

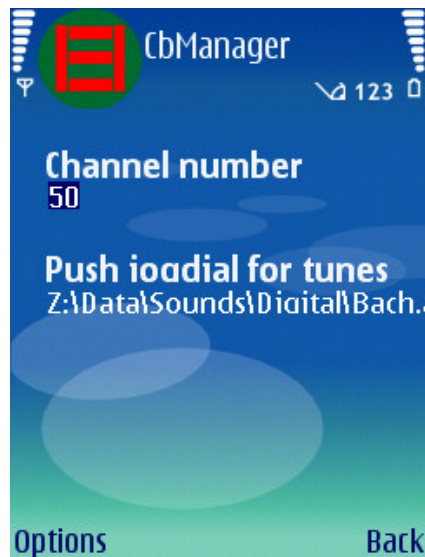


Figure 7: Screen to add tunes

When the user pushes the joystick the next screen becomes visible. In this screen all tunes and melodies available on the devices are shown. The user can now choose a tune/melody for a channel. If preferred the tune/melody can be played first before a choice is made. It is also possible to store a new tune/melody on the phone to use for a certain channel e.g. an alarm tone.

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
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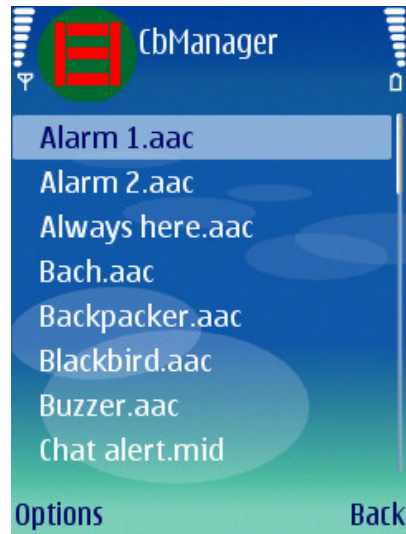


Figure 8: Tunes to choose from

A help screen is available which explains to the user the working of the application. This help screen becomes visible when the user chooses <Option><Help> from the main screen of the application.

In the header, at the top of the window, data is shown about the GSM network you are connected with: Mobile country code, Mobile network code, Location area code and cell id. These data are refreshed each 10 seconds. In the middle of the screen a list is shown with received CB messages. The contents of the CB messages are

Back

Figure 9: The Help screen

4.6 CONTENTS OF THE CELL BROADCAST MESSAGES

The contents of the received cell broadcast messages is stored in the file CBMessages.txt in the map C:\data on the phone. An example of such a file is given below.

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
---	--



Figure 10: The contents of the CB messages

The information on the main screen of the application is stored in the file CbManager.dat. This file has to be transferred first to a PC in order to be opened. Transferring of this file can be done with Nokia PC Suite. An example of this file is give below.

1	Channel	Date	Time	Lac	Cell
2	50	230409	13:58:05	33	9281
3	50	230409	13:57:47	33	12803
4	50	230409	13:57:21	33	9281
5	50	230409	13:56:35	33	12803
6	50	230409	13:40:45	33	9281
7	50	230409	13:39:43	33	9281
8	50	230409	13:39:12	33	8641
9	50	230409	13:35:36	33	9281
10	50	230409	13:35:11	33	12803
11	50	230409	13:27:46	33	9281
12	50	230409	13:27:15	33	12803
13	50	230409	13:26:45	33	9281
14	50	230409	13:26:11	33	12803
15	50	160309	18:45:48	33	8641
16	50	160309	18:45:24	33	9281
17	50	160309	18:44:02	33	8641
18	50	160309	18:42:42	33	9281
19	50	160309	18:40:58	33	8641
20	50	160309	18:40:34	33	9281
21	50	160309	18:38:12	33	8641

Figure 11: The list of Cell broadcast messages on the PC

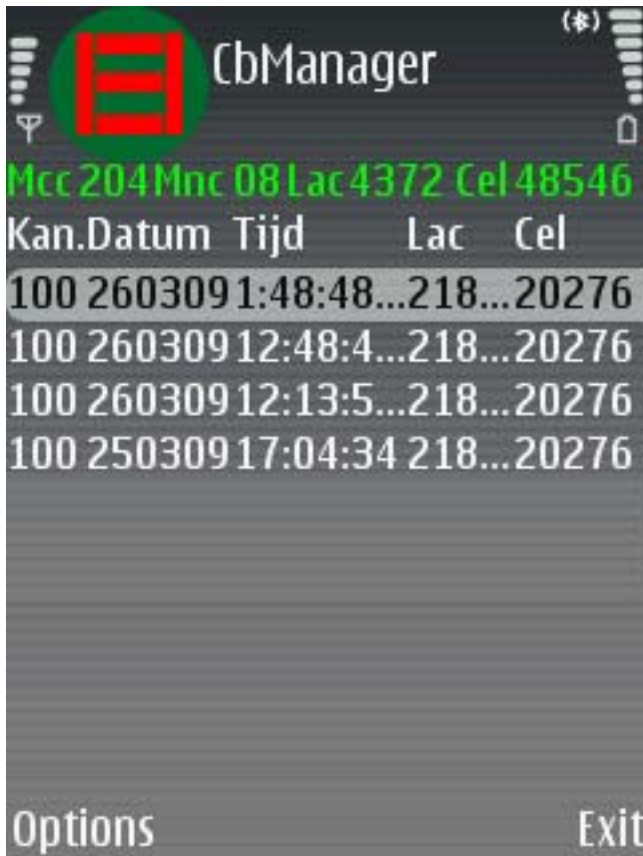
Removing this file from the phone will also clear the main screen of the application. This has to be done while the application is closed.

Project: CHORIST EC contract: 033685	Deliver. ref.: SP3.D18 Deliver. title: Design of a prototype Cell Broadcast reporting application, to be used on symbian based handsets. (PUBLIC) Deliver. version: 1.1 Submission date: 25/05/09
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4.7 CELL BROADCAST MESSAGES IN BARCELONA

During the Barcelona life demonstration we have used the CB system sending out a couple of messages.

You can see the log of the Cell Broadcast manager in the following picture:



You can see that in the evening before the event in Barcelona, we did a trial whether the system was still working at the location where we were situated at that time: the date was March 25 2009 at 17.04 hrs in the evening.

During the life demonstration at the same location we have received three different types of messages, over the channel number 100. The messages were received on March 26 and the time was: 12.13 hrs, 12.48 hrs and at 1.48 hrs (13.48).