



COGKNOW

D2.4.2

Prototype release of multi-modal interfaces

Version 1.0

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## Context

WP 2	<p>WP2 addresses the development of the necessary cognitive prosthetic which is to be used in the home environment to support users with cognitive dysfunctions. This will take the form of a wearable mobile device, for example in the form of a wristband and a visual terminal/docking station.</p> <p>In summary the WP has the following objectives:</p> <p>To translate the findings from user analyses into technical specifications.</p> <p>To realise a suite of multi-modal interfaces to deliver reminders.</p> <p>To realise a remotely configurable mobile solution.</p> <p>To develop a home-based visual interface</p>
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## History

Version	Date	Authors	Sections Affected
0.1	4/01/2009	Marko Peterson	Outline of the document, content.
0.2	15/04/2009	Marko Peterson	Section 3, added about the vibration effect.
0.3	17/04/2009	Marko Peterson	Vibration to separate section. Johan made the first review.
0.4	20/04/2009	Marko Peterson	Chapter 4 Multimodality, new screenshots.
0.5	24/04/2009	Chris Nugent	Minor changes, a few comments.
0.6	27/04/2009	Marko Peterson	Made final adjustments based on Chris comments. URL of the video.
1.0	28/04/2009	Ricardo Castellot	Cosmetic changes for submission. Public URL of the video.

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# 1. Summary

This deliverable gives an overview of the multimodality used in the portable user interface of CogKnow system (CCA) which has been developed within the Project to offer people suffering from mild dementia with a system provided of easy-to-use, multimodal interfaces through which they can use of a multitude of services aimed for their help.

## **2. Introduction**

The aim of this document is to highlight the multimodal aspects of the third version of the prototype of the CogKnow project's portable device (CCA). These aspects can be generally divided into three major parts: visible, audible and sensible (touch screen) interaction between the user and the mobile interface itself.

The mobile device, referred to as the CCA (CogKnow Cognitive Assistant), can be used as a parallel device to the CHH (CogKnow Home Hub) and provides a streamlined representation of the information represented on the CHH. The idea of this device is that it can be used while moving around in the house and also can be used outside the PwD's home.

### 3. The third CCA prototype

In general there is one main screen on the CCA where there are several shortcuts or submenus which can be used to activate the different services by simply pressing the icons. These services provide the user (PwD) with a visible, an audible and sensible feedback.

#### 3.1. Time indication

The CCA provides a clock in digital and analogue mode (see Figure 1). The mobile device's clock is synchronised with the CHH. The option to press the small clock on the CCA screen, next to the date, offers the PwD with the ability to choose between digital clock or both analogue and digital. Pressing the large clock makes it disappear and the home screen will subsequently appear.



Figure 1: Displaying a clock that can be analogue and digital.

### 3.2. Picture dialling

Picture dialling is available on the mobile device to facilitate social communication when the PwD is outside of the home environment. The phonebook menu is activated by pressing a phone icon on the mobile device screen. There can be maximum of five contacts in the list. Figure 2 shows temporarily default icons instead of photographs of real people which are used in live version.

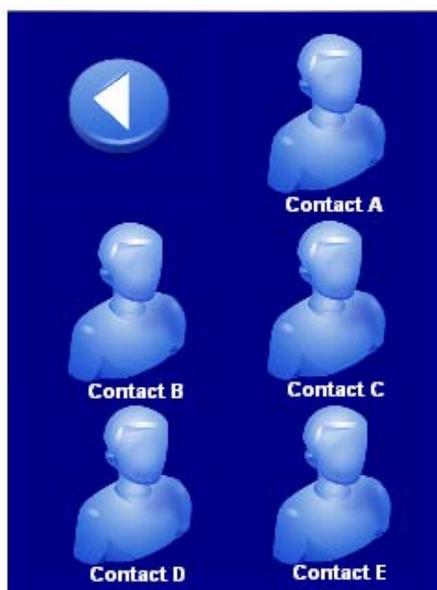


Figure 2: Mobile device showing the picture dialling service.

For the mobile device there is also a shortcut to request for help by pressing the help icon. An important feature of this service is that it is always visible and prominent to allow speedy access in moments of stress or panic (see Figure 3). By pressing the emergency contact button, this service is activated and it automatically places a call to the primary carer.



Figure 3: Help call is to be activated after pressing the help icon.

### 3.3. Reminders

A very important element in terms of providing support to PwDs is the possibility to have automatic reminder events with an alarming sound. This information will be previously set by the carer and will be displayed to the PwD on the screen of the CCA as shown in Figure 4. The events are sent from the CS and are synchronously displayed on the screen of the CCA and the CHH. The reminder can be cancelled on the both devices by pressing the animation on the screen.



Figure 4: Incoming reminder on CCA.

### 3.4. Media playing

The feature provided with this service is that of music playback. This involves the ability to turn on/off music via a single icon on the touch screen of the CCA. There will appear informative text explaining the action taken after pressing the icon (see Figure 5).

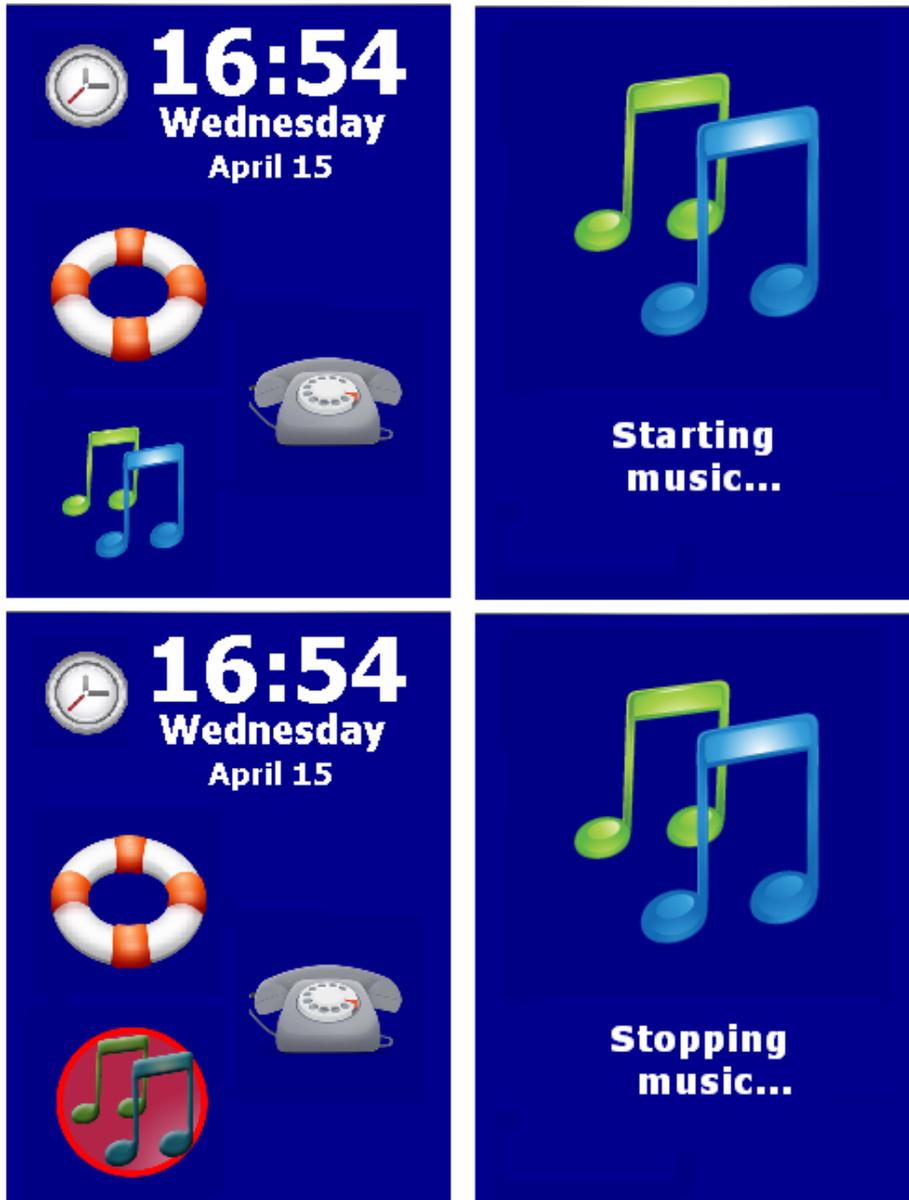


Figure 5: Control of the music playback service from the CCA.

### 3.5 The TakeMeHome

When the user goes out of the home, and the CCA loses the connection with the CHH, the radio and music functionalities are deactivated, and the TakeMeHome functionality becomes available (see Figure 6). The icons are also relocated according to the available space.

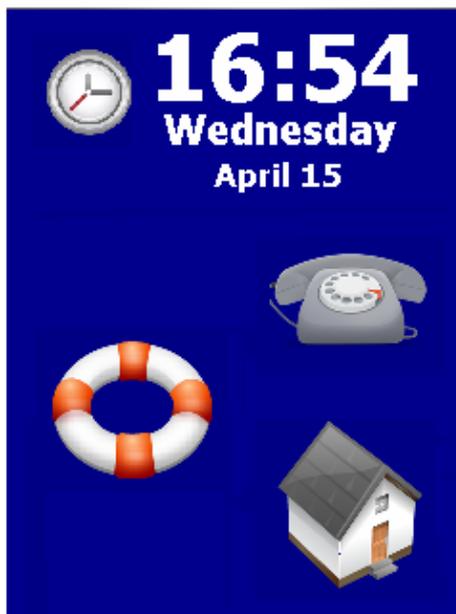


Figure 6: CCA’s screen after loosing connection with the CHH.

The TakeMeHome functionality offers sound-guided and visible directions to return PwD’s to their home. About 50m before a turning point is reached; directions are given visually (see left image in Figure 7) as well as an auditory navigation direction. For example “<PlingPlingPlong> After 50 meters, <Plong> turn right”. When the destination was approached within about 30 meters, the screen would look like the right image on Figure 7 and the message “<PlingPlingPlong > you have reached your destination” would sound. After that the screen will automatically return to the home screen.



Figure 7: Turning point before 50 and reaching the destination.

### 3.6 Locating mobile device

The CHH provides a functionality to locate the CCA. It can be activated by pressing an icon on the screen of the CHH. Once the activation message has been received by the mobile device, it will sound an audible alarm for a predefined length of time. The mobile device will then acknowledge receipt of the activation command to facilitate feedback via the stationary device. The alarm can be ended by pressing the image on the screen of the CCA (see Figure 8).

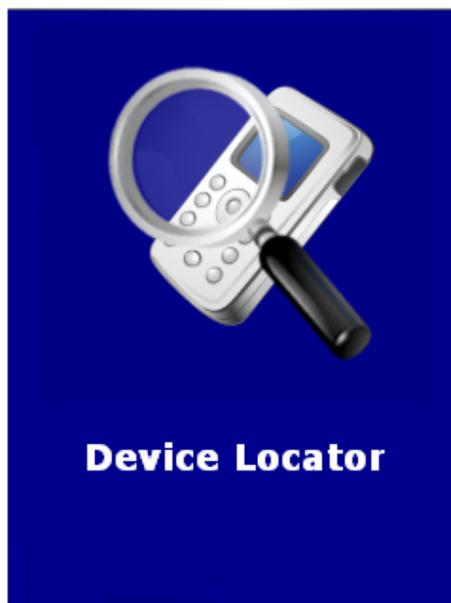


Figure 8: The image appears on the screen of CCA.

## 4. Multimodality in CCA

Multimodality is a combination of different ways of interacting with users, both in terms of obtaining input and providing output. In the CCA there are basically four ways of doing this: image, audio, text and physical feedback. The last one represents the vibration effect, which is produced when commands are accepted by the CCA. Compared to Field Trial 2, there was added an extra option when communicating with users. The vibration also is active when some task is processing – showing the reminder or locating device. Then it vibrates several times constantly till the screen is pressed for acknowledgement. It is completed in order to obtain the user's full attention.

For example if the user presses the music icon on its cover area on the screen, the device responds with one-time-vibration. If the user misses the icon area, the vibration will not be produced and therefore no action will proceed.

The feedback vibration option is included in showing clocks, navigating phonebook, dialling a contact, listening to the music, accepting device locating and also accepting reminders.

The reminders are something that supports all – image, audio, text and vibration. Not to mention there is a great need for all of these to perform in order to get users to acknowledge the necessary action.

# Conclusions

This report has provided an overview of multimodality in the CCA prototype of the CogKnow Project.

This deliverable also includes video material which is available on the following URLs (internal and public ones):

[https://cdh.project.ltu.se/main.php/Mobi\\_Multimodal\\_Interfaces\\_CCA\\_FT3.wmv?fileitem=4063293](https://cdh.project.ltu.se/main.php/Mobi_Multimodal_Interfaces_CCA_FT3.wmv?fileitem=4063293) .

<http://www.youtube.com/watch?v=Yy1GfUmprE>