D4.2- Mobile Hardware Readiness Report

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D4.2

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Deliverable 4.2	Executive Summary
This document describes the selection of mobile devices to sort out the right device for the mobile caretaker/volunteer to access the KONTS-system. Different device are compared and a base-station as add-on is suggested.	

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4			

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1 Introduction

According to the results of user-inclusion process (D2.1) a decision has been made (D4.1) that two types of hardware will be prepared:

- A semi-stationary information desktop
- A mobile (tablet based) device with an optional "docking station" used for development and debug purposes

This document describes details of the later one.

2 Mobile Device

For the purpose of this project an Android based handheld device is required. As there are numerous different devices of this type available on the market, there is no need to develop a new one. So the market has been examined in order to choose the best available device according to the following criteria:

- Android 4+ is required (preloaded or available as an update)
- Touch screen should be big (7"+ if possible)
- Front camera
- Device performance (processor, memory etc.)
- Support for Bluetooth 4 is desirable (it offers an option for possible future development of wireless data interchange with other devices)
- Price

There are many different tablets available on the market. Four of them, with screen size of 7", android OS and price between 80 € and 150 €, were selected and reviewed.

2.1 Samsung Galaxy Tab 3 Lite 7.0 VE

Device characteristics:

- CPU: quad-core, 1.3 GHz
- RAM: 1 GB
- Storage: 8 GB, optional SD card
- Display: 7", 600 x 1024 px
- Touch screen: capacitive, multi-touch
- OS: Android KitKat (v. 4.4)
- Camera: back - 2 MP, front - none
- Connectivity: Bluetooth 4.0, Wi-Fi b/g/n, micro USB 2.0
- Battery: Li-ion 3.6 Ah

Currently it is available for about 110 € (contract-free) and has relatively good specifications. Samsung has also good device drivers for Windows, which is very important for development and debug purposes. It seems a good choice but it has no front camera, which is a major drawback for intended use.

Figure 1: Samsung Galaxy Tab 3 Lite 7.0 VE

2.2 Blow WhiteTAB 7.4HD

Another device we reviewed is Blow WhiteTab 7.4HD from not-so-known company. Its official price is 80 € but is available for only 50 € in some stores, which is extremely low price for such device. However, specifications are pretty bad. It has a low capacity battery and a low resolution camera. Bluetooth support would also be desirable.

Figure 2: Blow WhiteTab 7.4HD

Device characteristics:
- CPU: quad-core, 1.2 GHz
- RAM: 512 MB
- Storage: 8 GB, optional SD card
- Display: 7", 600 x 1024 px
- Touch screen: capacitive, multi-touch
- OS: Android Lollipop (v. 5.1)
- Camera: back – 0.3 MP, front – 0.3 MP
- Connectivity: Wi-Fi b/g/n, micro USB 2.0
- Battery: Li-ion 2 Ah

2.3 Asus Memopad 7

Device characteristics:
- CPU: Intel Atom 64 bit, quad-core, 1.8 GHz max.
- RAM: 1 GB
- Storage: 16 GB, optional SD card
- Display: 7", 1280 x 800 px
- Touch screen: capacitive, multi-touch
- OS: Android KitKat (v. 4.4)
- Camera: back – 2 MP, front – 0.3 MP
- Connectivity: Wi-Fi b/g/n, micro USB, Bluetooth 4
- Battery: Li-Po 3.9 Ah

Figure 3: Asus Memopad 7

This device, with official price at 120 €, seems pretty good choice for purposes of this project. It has all of required functions, a good battery and other specifications. The only draw-back is low resolution of the front camera.

2.4 LG G Pad 7.0

LG offers another tablet, with similar characteristics as Asus Memopad 7. The most notable difference is much better front camera (1.3 MP compared to Memopad's 0.3 MP). Official price is 150 €. A downside of this device is position of rear speakers, which can be easily blocked by hand.

Device characteristics:
- CPU: quad-core, 1.2 GHz max.
- RAM: 1 GB
- Storage: 8 GB, optional SD card
- Display: 7", 1280 x 800 px
- Touch screen: capacitive, multi-touch
- OS: Android KitKat (v. 4.4)
- Camera: back – 3 MP, front – 1.3 MP
- Connectivity: Wi-Fi b/g/n, Bluetooth 4
- Battery: Li-Po 4 Ah

Figure 3: LG G Pad 7.0

2.5 Device comparison chart

Device	Galaxy Tab 3 Lite	Blow WhiteTAB	Asus Memopad 7	LG Pad 7.0
Screen size	7"	7"	7"	7"
CPU	1.3 GHz	1.2 GHz	1.8 GHz	1.2 GHz
RAM	1 GB	512 MB	1 GB	1 GB
Internal memory	8 GB	8 GB	16 GB	8 GB
Front camera	No	0.3 MP	0.3 MP	1.3 MP
Back camera	2 MP	0.3 MP	2 MP	3 MP
Battery	3.6 Ah	2 Ah	3.9 Ah	4 Ah
Bluetooth	4.0	No	4.0	4.0
Price	110 €	80 €	120 €	150 €

2.6 Device Selection

Blow WhiteTab 7.4 HD is not appropriate as it has too bad specifications. *Galaxy Tab 3 Lite* has much better specifications, but has no front camera, which is required for this project. *Asus Memopad 7* and *LG Pad 7* are both good devices. The later one has been chosen as reference device as it has much better front camera.

It is important to note that this device has been selected as a reference device for the reasons stated above, but KNOTS mobile application should also work on other devices with similar characteristics.

3 Mobile Device Base-station

The base station will offer enhanced audio-quality compared to the mobile device, enabling the mobile device also being used by the person taken care of. It will consist of an embedded PC with network, video and USB connections. Speakers and 2 to 6 microphones will be integrated in that device, attached to the embedded PC via a driverless USB Audio-Class 1.0 interface. Audio-connection to the mobile device will be provided by a commercial Bluetooth 3.0/4.0 Adapter.
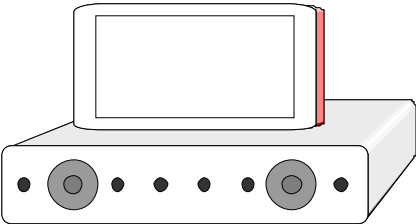

Figure 2: Sketch of base-station prototype

In order to simplify and speed-up development, mobile device base-station and semi-stationary desktop device development has been temporary merged. Most of research and development that was intended to be done on mobile base-station prototype will be done on semi-stationary desktop device. The later one is described in deliverable D4.1.

The device shall fulfill the following requirements:
- 2-6 microphone channels for beamforming to enhance quality of picked up speech
- Speakers with at least 2W power to supply sufficient output volume
- Audio-connectivity to tablet- or amartphone using Bluetooth or wifi
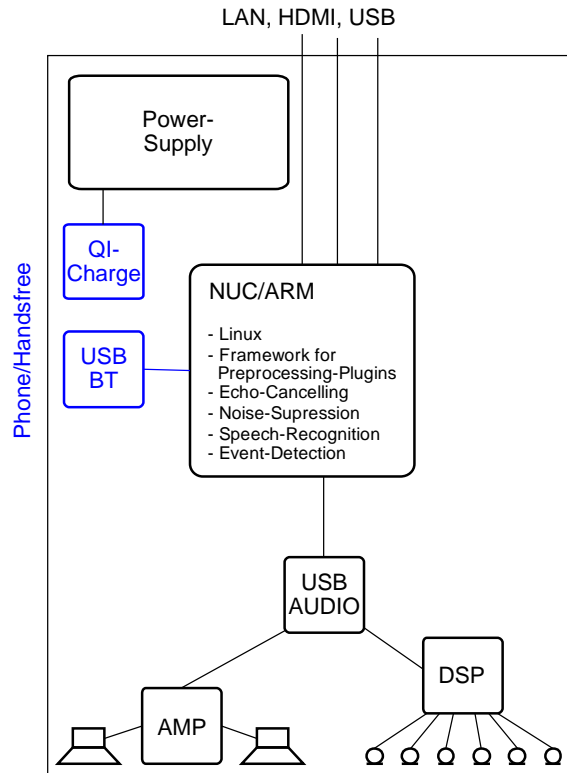- Stand/docking station with charging functions for the hardware chosen.

Figure 3: System diagram of base-station

4   Software

Software has to be compatible with Android 4.2 (API 17) and newer and capable of running on devices described in deliverable D4.1 and herein.

Details about software for this device are available in deliverable D2.2 and in D4.1.