

ALFRED

Personal Interactive Assistant for Independent Living and Active Ageing



WP4 – Pillar I: User-Driven Interaction Assistant

D4.5.2 – App Building and Deployment

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This deliverable provides a description of the apps implementation within Task 4.5, related to the user-driven interaction assistant component. It describes the initiatives agreed in order to ensure the fulfilment of the functionalities expected by every app.

It reminds how to install and execute the apps, that are integrated in the Personal Assistant (PA) and with CADE. Last but not least, it will provide an overview of the limitations of the current prototype and an outlook on the further developments.



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Executive Summary

One of the most outstanding characteristic of ALFRED system is its capacity for supporting the older people through speech recognition and text-to speech mechanisms. This characteristic is the base of the Pillar I: User-Driven Interaction Assistant implementations.

The main goal is to provide to the end user a natural and fluent way for interacting with the ALFRED apps in order to ease its usability and comprehension by the older people.

T4.5 concerns app development (and implicitly, DDD development). In addition to building 5 apps, it is in the scope of this task to support other work packages with DDD development too.

The apps included in WP4 are focused in the interaction by voice, in order to cover the user stories chosen in D2.3. Tutorial app tries to introduce the end user in the utilization of the voice for giving additional information and asking for commands. Questionnaires app provides to the end users some information about the topic chosen by them, in a similar way, News apps, provides them the most recent news depending on the type of News demanded. Chat app allows the end user to contact by a call or a message with the person mentioned and Help app allows them to call directly with an “emergency number” or with their caregiver.

All of them are based in the interaction with the user through the voice. They are supported by DDD that implement the dialogues for each app, and due to their characteristics, some parameters have to be passed for improving their usability.

All these apps will be supported with a simply graphical interface for helping the end user to understand the operation, but this should be accesory. The end user might operate every app mainly using his voice.

An overview about every one of the apps are included in this deliverable and some screenshots are showed.

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1 Introduction

ALFRED – Personal Interactive Assistant for Independent Living and Active Ageing – is a project funded by the Seventh Framework Programme of the European Commission under Grant Agreement No. 611218. It will allow older people to live longer at their own homes with the possibility to act independently and to actively participate in society by providing the technological foundation for an ecosystem consisting of four pillars:

- **User-Driven Interaction Assistant** to allow older people to talk to ALFRED and to ask questions or define commands in order to solve day-to-day problems.
- **Personalized Social Inclusion** by suggesting social events to older people, taking into account their interests and their social environment.
- A more **Effective & Personalized Care** by allowing medical staff and caretakers to access the vital signs of older people monitored by (wearable) sensors.
- **Physical & Cognitive Impairments Prevention** by way of serious games that help the users to maintain and possibly even improve their physical and cognitive capabilities.

This deliverable provides a description of the apps implementation of Task 4.5 App Building and Deployment. It specifies the scope of this version and the degree of fulfilment of the requirements to be covered by the component. It specifies how to install and execute the apps, that are integrated in the Personal Assistant and how to use the CADE component. Finally, it will provide an overview of the limitations of the current prototype and an outlook on the further developments.

1.1 ALFRED Project Overview

One of the main problems of western societies is the increasing isolation of older people, who do not actively participate in society either because of missing social interactions or because of age-related impairments (physical or cognitive). The outcomes of the ALFRED project will help to overcome this problem with an interactive virtual butler (a smartphone application also called ALFRED) for older people, which is fully voice controlled.

The ALFRED project is wrapped around the following main objectives:

- To empower older people to live independently for longer by delivering a virtual butler with seamless support for tasks in and outside the home. This virtual butler (the ALFRED app) aims for a very high end-user acceptance by using a fully voice controlled and non-technical user interface.
- To prevent age-related physical and cognitive impairments with the help of personalized serious games.
- To foster active participation in society for the ageing population by suggesting and managing events and social contacts.
- And finally, to improve caring by offering direct access to vital signs for carers and other medical staff as well as alerting in case of emergencies. The data is collected by unobtrusive wearable sensors monitoring the vital signs of ALFRED's users.

To achieve its goals, the project ALFRED conducts original research from a user centred perspective and applies technologies from the fields of Ubiquitous Computing, Big Data,

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Serious Gaming, the Semantic Web, Cyber Physical Systems, the Internet of Things, the Internet of Services, and Human-Computer Interaction. For more information, please refer to the project website at <http://www.alfred.eu>.

1.2 Deliverable Purpose, Scope and Context

The purpose of this deliverable is to describe the apps developed related with WP4 User-Driven Interaction Assistant based on and using the components developed in previous tasks.

1.3 Document Status and Target Audience

This deliverable is qualified as confidential in the Description of Work (DoW), for this reason the information gathered and their distribution is mainly for the project participants. The current version is the 1st of the two listed in the DoW.

1.4 Abbreviations and Glossary

A definition of common terms and roles related to the realization of the ALFRED project as well as a list of abbreviations is available in the supplementary document “Supplement: Abbreviations and Glossary”, which is provided in addition to this deliverable. Further information can be found at <http://www.alfred.eu>.

1.5 Document Structure

This deliverable is broken down into the following sections:

- Chapter 1 provides an introduction for this deliverable including a general overview of the project, and outlines the purpose, scope, context, status, and target audience of this deliverable.
- Chapter 2 describes the context and the purpose of the deliverable, what it contains and how it is related to the ALFRED system overall.
- Chapter 3 provides information about the current status of five apps that have been developed in the context of the User-Driven Interaction Assistant in the ALFRED system. An overview of their main functionalities and the right way to operate them are shown.
- Chapter 4 presents the requirements for setting up the different apps.
- Chapter 5 provides instructions on how to install and deploy all the apps.
- Chapter 6 details how the apps can be used after its deployment.
- Chapter 7 outlines the testing plan to validate them.
- Chapter 8 details the KPI performance indicators.
- Chapter 9 summarizes the aforementioned content.

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2 Context and Scope

Along the WP4 execution, different tasks have been done for defining and developing the basic elements that compound the infrastructure necessary for the development of apps based on the speech recognition and text to speech methods.

Every one of the four pillars where ALFRED is based on, has a specific task for the development of five apps that serves as reference for the rest of technical partners and 3rd party developers, and for testing the ALFRED system in the Pilots executed during the last months of the project.

This deliverable affords the development of apps focused on the User-Drive Interaction Assistant, mainly destined to implement user stories based on the voice utilization for exchanging information between the end user and the ALFRED system. User stories are grouped into apps by their functionality. Chat app groups US028, US057, US060, and US083 user stories, News app implements US048, Tutorial apps implements US015, Help app groups US051, US049 and US058, and finally Questionnaires app groups US060 and US061. Although these apps have a simply graphical interface for helping the end user to follow the operation of the app, the main element is the DDD, that supports every app.

Some of them requires a static DDD and some others require the utilization of parameters for managing the behaviour expected by the users. This is the most critical element to be tested and validated in these apps.

In order to ensure the right integration and the interaction between the DDD and the apps, some processes have been established and executed. Developers wrote interaction tests and they were executed every time someone changed a DDD or something was modified in the CADE server.

Along the current task, different tests have been executed, the required adaptations to the updated CADE component have been made and the demanded support to the end users during the preparation and the execution of the pilots, have been provided.

The deliverable includes the mentioned apps and their correspondent DDD files.

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3 State of the Development

This chapter describes the functionalities of the five applications developed in task 4.5. All of these applications are based on user stories compiled in the deliverable D2.3.

3.1 Chat

The Chat app is based on the User Stories US028, US057, US050 and US083, all of them have been grouped in a only one app because of the common characteristics shared by them:

- As an older person, I would like ALFRED to help to communicate with my friends and family
- As an older person, I would like to use ALFRED to send messages
- As a medical caregiver, I would like to use videocall in case of emergency
- As an older people, I would like to just press one button to call my caregiver

The idea of Chat app is to provide one way for solving an end user's communications needs with other persons. The operation with this app is mainly addressed by voice, but a simple graphical interface will facilitate the use and actions realized in every moment.

The end user could start the interaction with the app giving it one of the main commands supported (make a call, send a message, make a video call or call to my caregiver):

- "I would like to call John", and the app looks for John's phone number, shows it in the screen and calls him. This option will be supported by a screen with a button for making the call. The call could be made in only one iteration or in more than one, if the first command is not enough accurate to identify the person within the contact list. In this case, Chat app will ask the end user additional information to identify the right person. "Please, could you give me the first and the last name?"

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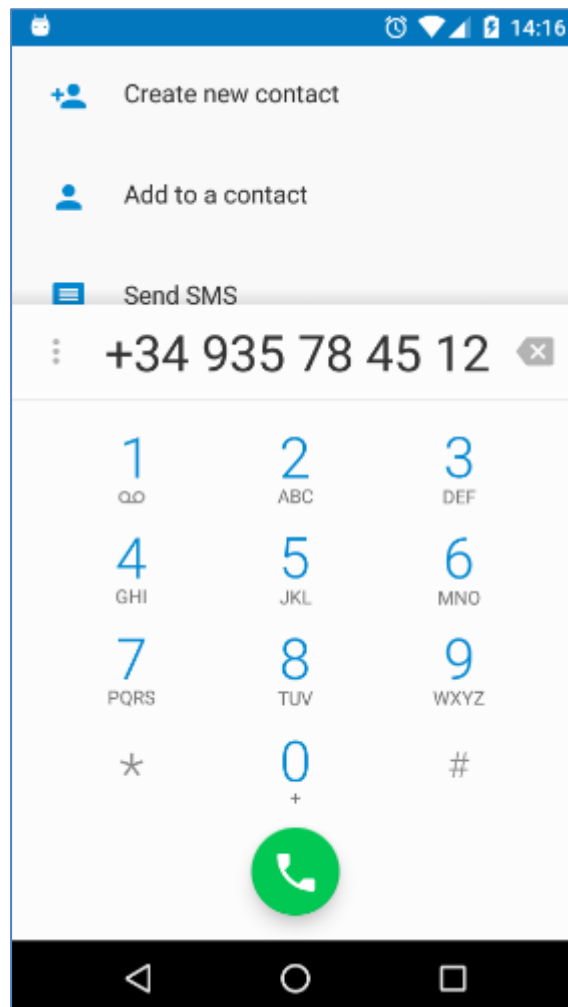


Figure 1: Chat App – Making a Call

- “I would like to send a message to John”. The app will ask for the message to be sent. It will look-up for John’s phone number and both informations will be shown in the screen while the message is sent.

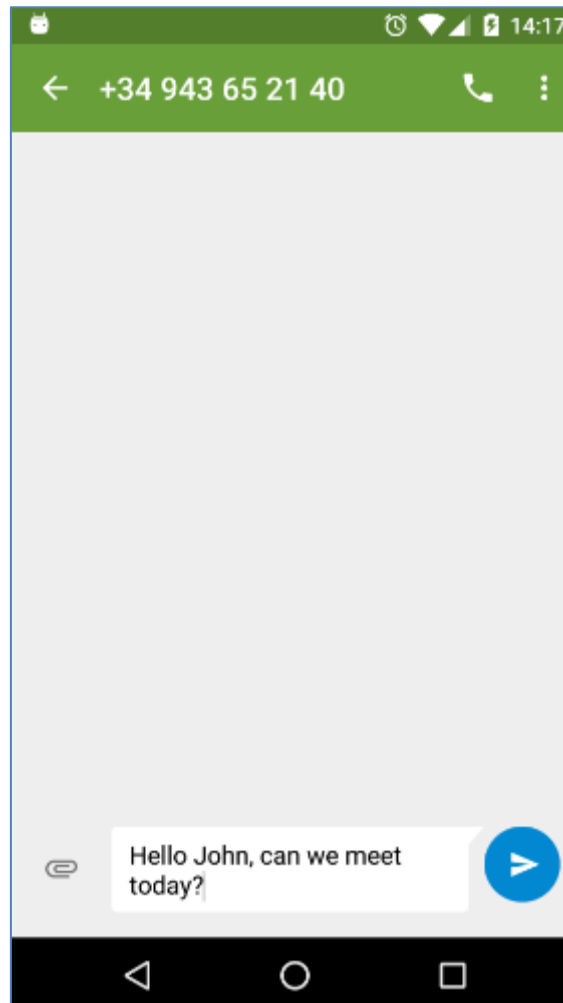


Figure 2: Chat App – Sending a Message

In a similar way as described in the previous case, if the command given to the Chat app is not enough accurate to identify the destinatary of the message, additional information will be asked to the end user by the Chat app.

- “I would like to call my caregiver”, the Chat app will show the screen for calling his caregiver and will make the call. The caregiver phone number should be provided by the user contacts.



Figure 3: Chat App – Call to my Caregiver

- “I would like to make a video call to my caregiver”, the Chat app will start the Skype app with the caregiver contact, this should be provided by the user contacts.



Figure 4: Chat App – Making a Video Call

At this version of the Chat app, the phone numbers are obtained from the smartphone contacts, but the Chat app is ready to be integrated with the Personalization Manager.

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3.2 News

The News app is based on the User Story US048 and is focused to provide access to the News when the user asks for it:

- As an older person, I would like to use ALFRED to hear about the news.

News app will start when the end user gives a command such as:

- “I would like to hear about the news”. News app allows to specify the kind of news the user is interested in. “I would like to hear about the Sports News” or “Economy News”. News app will consider the topic given as well as the smartphone language as search parameters for managing the most accurate News.

The News will be displayed on the smartphone screen, and the user could hear them tapping on the “play” symbol shown in the top of the screen.

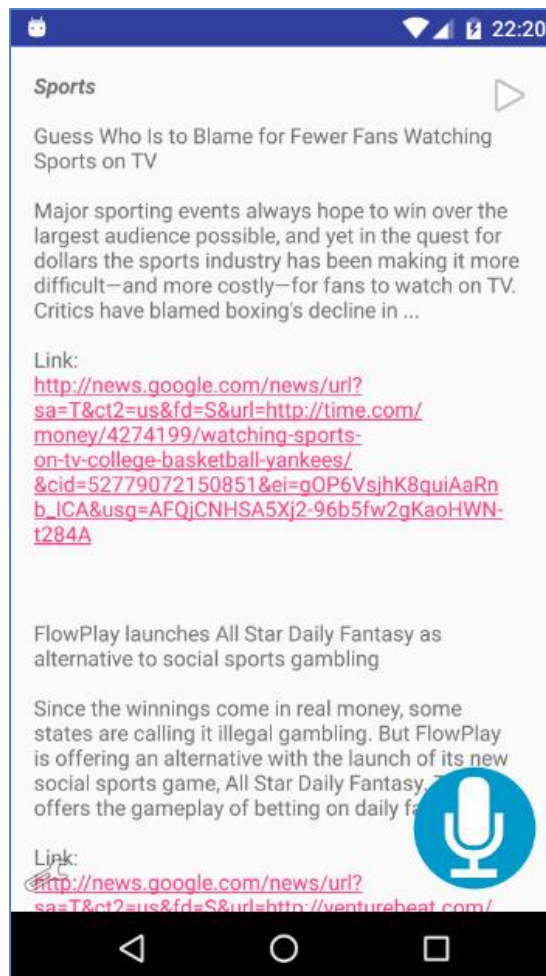


Figure 5: News App

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3.3 Help

The Help app is based on the User Stories US051, US049 and US058, all of them have been grouped in only one app because of the common characteristics shared by them:

- As an older person, I would like ALFRED to contact the nearest caregiver when I ask ALFRED for urgent help.
- As an older person I would like to use ALFRED to contact help in case of an emergency
- As an older person, I would like to ALFRED detect falls and send an emergency to a specific contact

Help app is focused to provide a quickly access to the caregiver of the older person or to the Help Services in case of emergency.

Only one command should start the Help app as “Could you help me?” or “Help, please”. Help app will show a screen with two big buttons, one for calling to his caregiver and another for calling the Help Service. These actions can be activated tapping on the buttons or giving the correspondent command “Caregiver” or “Help”.

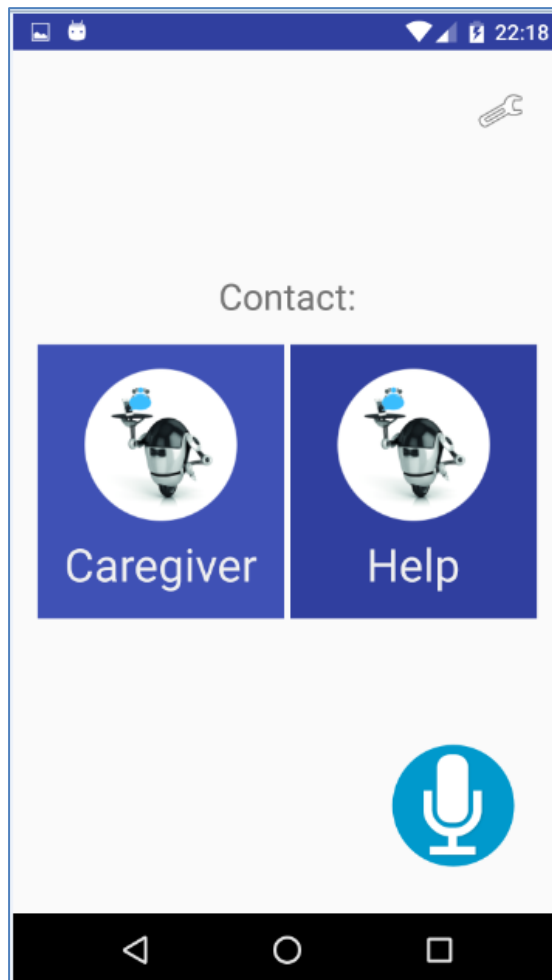


Figure 6: Help App

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Beside the voluntary way of operation mentioned before, where the end user asks for some help and the app responds, Help app supports an automatic mode of operation activated by a fall detection. If the Help app is running and the end user falls down, this situation is detected by the app and an automatic call to the Help Services is proposed to be confirmed or canceled by the user.

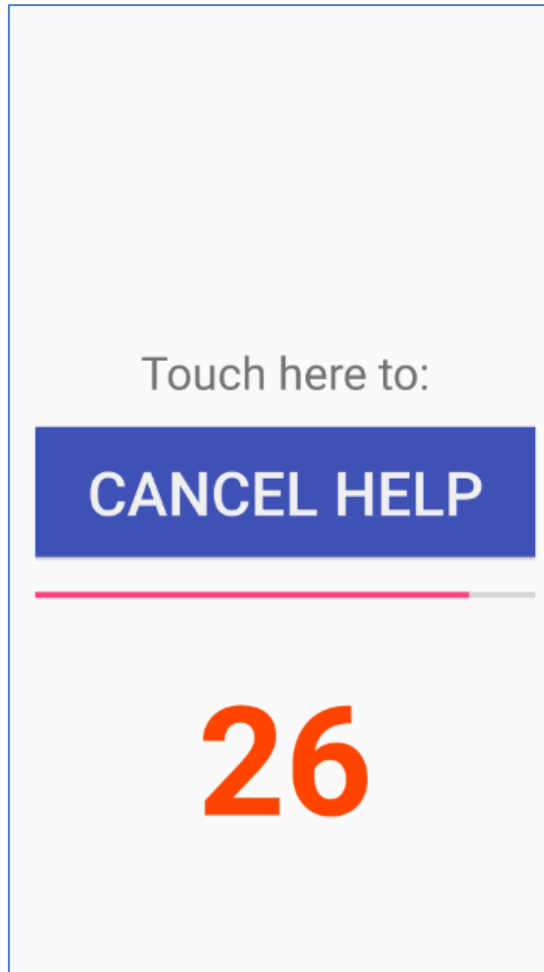


Figure 7: Help App – Automatic Mode

For avoiding false emergency calls, when a fall is detected by the Help App, the previous screen is shown with a delay of 30 seconds before to make the call. If the end user taps on the “Cancel Help” button, the call is canceled, in other way , the Help app will call to the Help Services.

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3.4 Tutorial

The Tutorial app is based on the User Story US015 and is focused to introduce the ALFRED assistant to the older end user:

- As an older person, I would like to have an introduction conversation with ALFRED so I can learn everything about him and he about me.

The Tutorial app is supported by some simple screens that complete the spoken instructions given by the app in order to make easy the learning process.

The app provides some information about the operation mode with the ALFRED assistant, the utilization of the microphone symbol in the majority of the ALFRED apps for giving commands or additional information through the voice.

Following the tutorial instructions, the older end user will be able to understand the operation mode and the responses of ALFRED assistant, depending on the commands given by the user.

At the same way, the user of the Tutorial app will learn the ALFRED assistant utilization through the dialogues, these are used by the ALFRED assistant to improve the end user's knowledge and to foster his self-improvement.

For instance, after the end user answers with his name, next questions made by the app, could be addressed to his own name:

- ALFRED: "Say my name is" followed by your name
- John: "My name is John"
- ALFRED: Alright John, my name is ALFRED

In the future, the information provided by the older end user could be used to feed the Personalization Manager.

Next screenshots show the Tutorial app.

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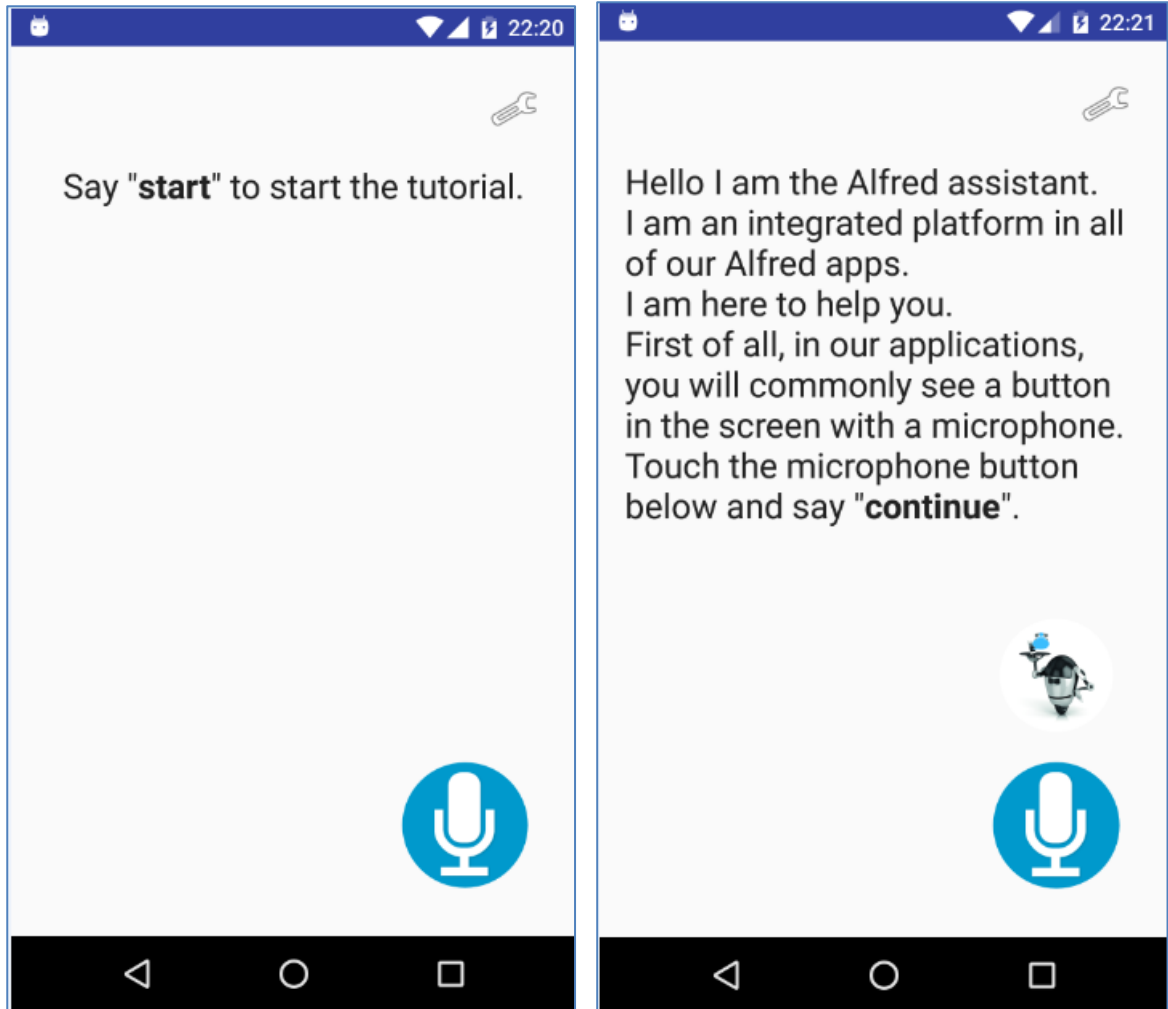


Figure 8: Tutorial App – Step 1 and 2

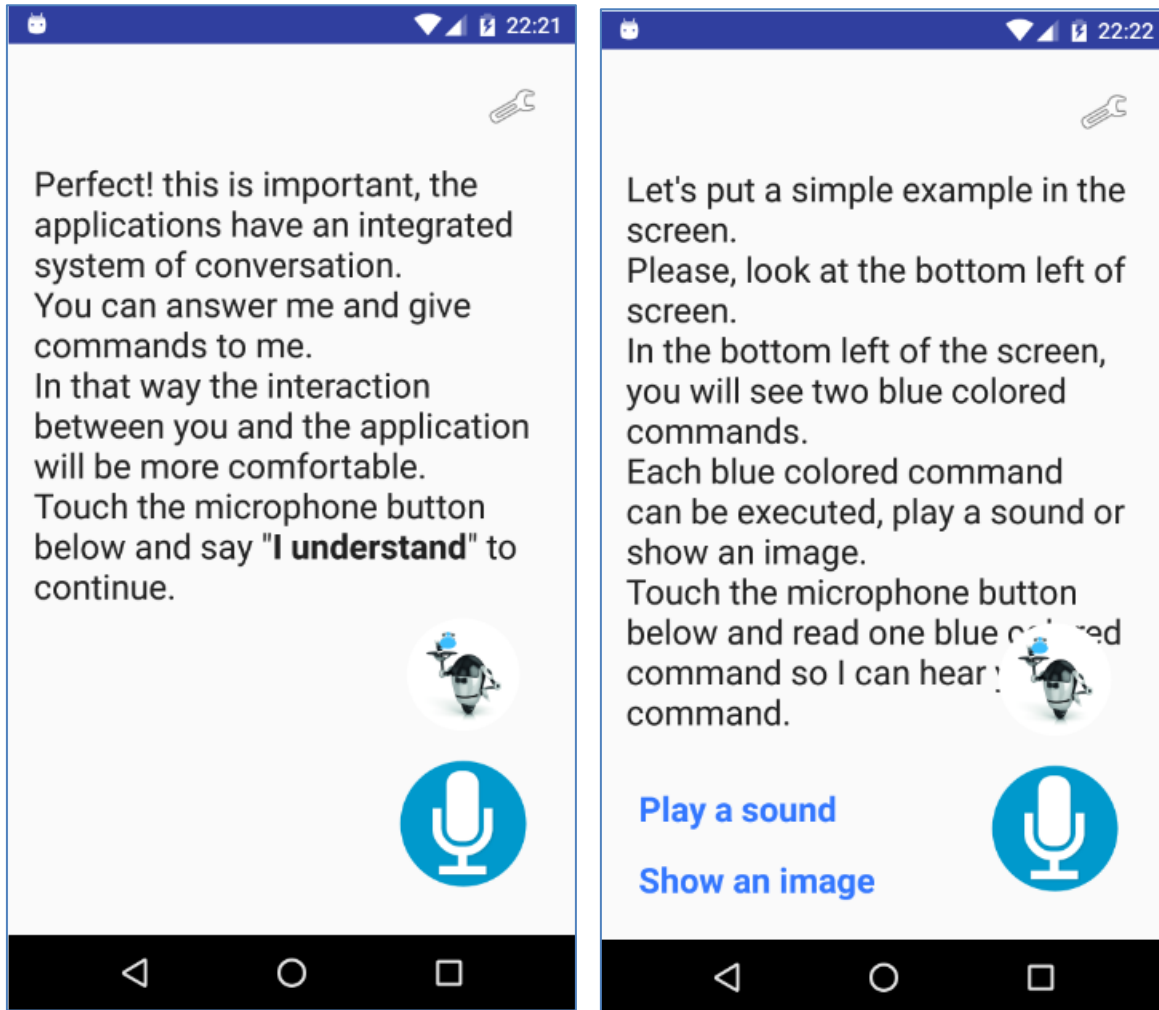


Figure 9: Tutorial App – Step 3 and 4

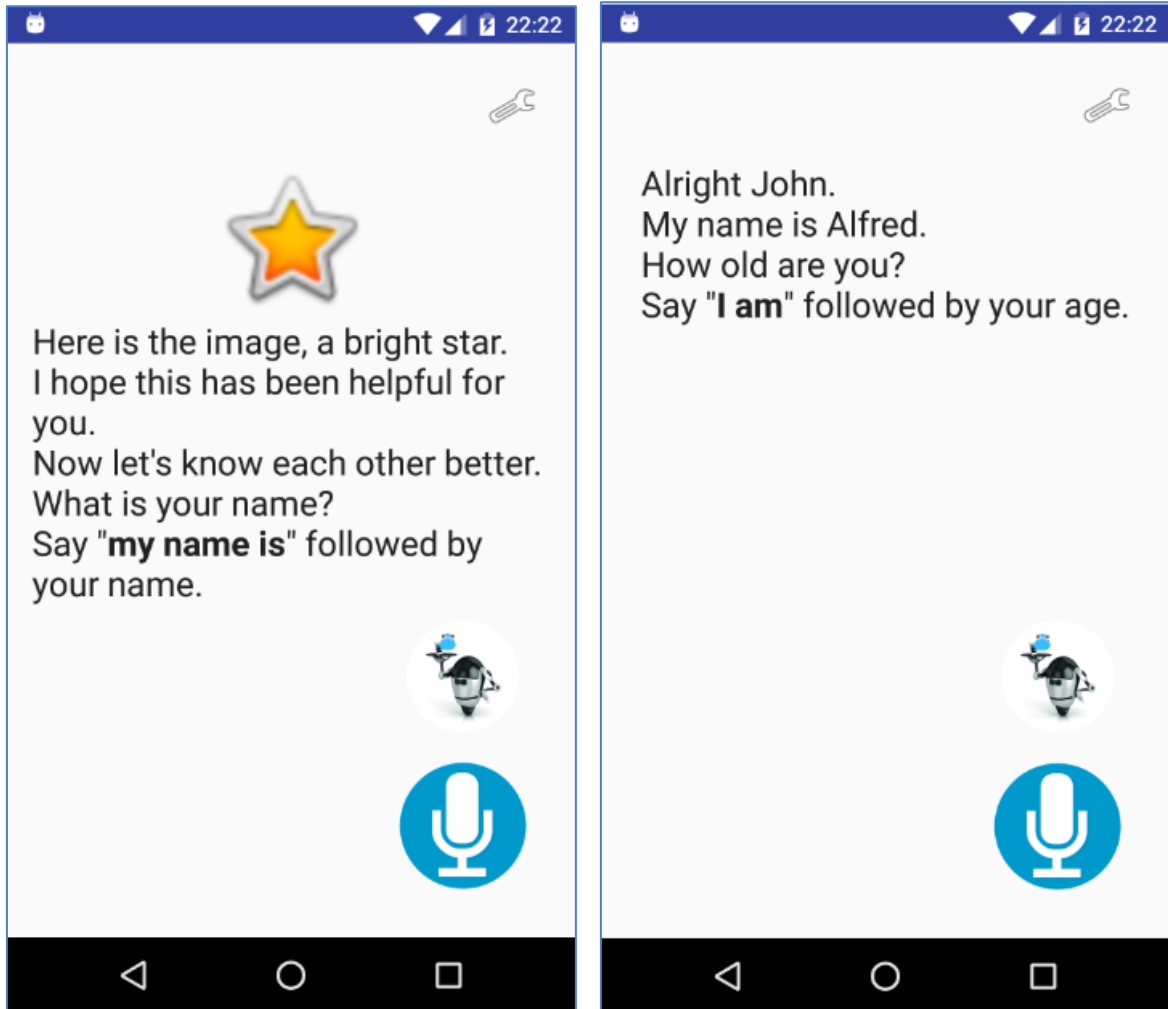


Figure 10: Tutorial App – Step 5 and 6

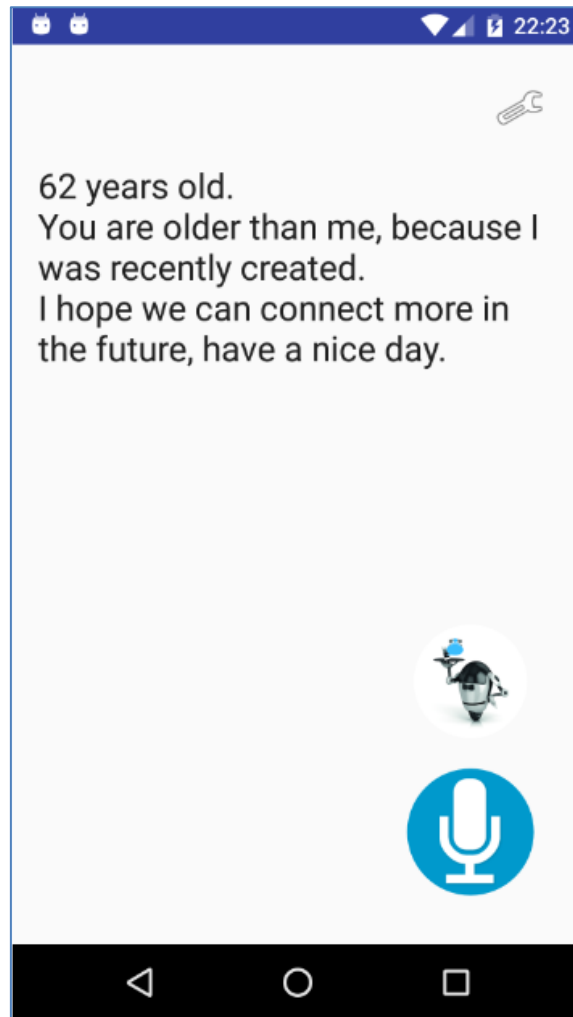


Figure 11: Tutorial App – Step 7

3.5 Questionnaires

The Questionnaires app is based on the User Stories US060 and US061, both of them have been grouped in only one app because of the common characteristics shared by them:

- As an older person, I would like to ALFRED to ask spontaneous questions but it would be better to programme it during certain times of the day.
- As an older person, I would like ALFRED to initiate questions, but it should be in the domains of my interest such as cinema, exhibitions, cooking...

Questionnaires app has a difference with the rest of the User-Driven Interaction Assistant apps. The other apps initiate the dialogues at the moment they are started by the users, but in this case, Questionnaires app initiates the dialogue several times along the day in order to start a conversation with the older end user about different topics.

The Questionnaires app initiates the dialogue every nine hours asking the end user:

- “What is he interested to talk about?”

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The older end user will be able to chose about a limited topic as Culture, Sports, Exhitions, World, Cinema and Curiosities. Questionnaires app will offer some information about the topic selected.

Next version of this app will include some configuration options to fix the frequency or specific hours for initiating the dialogues, and to configure the availability or topics of interest.

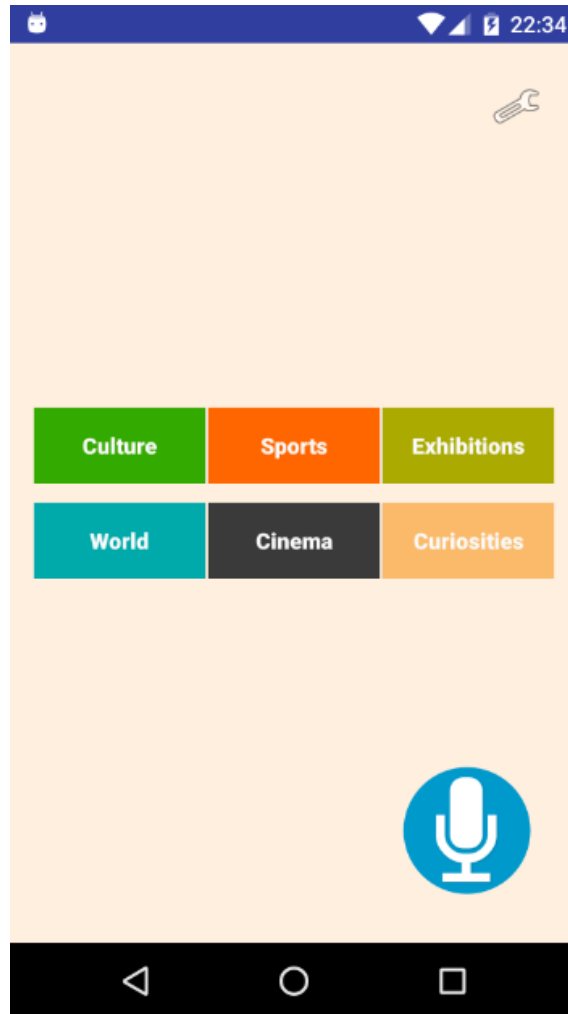


Figure 12: Questionnaires App

4 Requirements and Preparations

From a system viewpoint, all apps have been developed and tested on a Nexus 5 Android smartphone.

All apps are available within the ALFREDO marketplace.

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5 Deployment (Installation)

The applications are installed via the ALFREDO marketplace.

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6 Execution and Usage

Starting the mentioned apps is as with any other Android app downloaded from the Google Play Store. Only checking the application list, and tapping the correspondent icon is enough to start it. Detailed characteristics about their usage are given in section 3.

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7 Test Plan

All these apps are integrated with the PA and the CADE component, and they have been tested in the Pilots executed during the last months of the project.

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8 Target Performance

Table 1 lists the defined key performance indicators (KPI) for these apps:

Table 1: Key Performance Indicators

Topic	Description	Target KPI
Ease of Use	Ease of use is an important topic and performance indicator for this app. Each older end user should be able to use this component without greater knowledge of the connected databases but only with knowledge of the provided interfaces.	Based on a short feedback questionnaire the overall apps owner contentment we want to achieve is 90% . The questionnaire will consider the configuration complexity, integration and usage of the component and it's API.
App Launch / Load Time	All apps communicate with some web service of the ALFRED infrastructure. Therefore the time for launching the app and loading the required data should be reduced to a minimum. Users should be able to launch the app, load new pages and make purchases seamlessly without thinking, <i>What's taking so long?</i>	The rate of users that are happy with the loading time shall be 95% or higher. The questionnaire will consider the loading and launch time of the app and give an appropriate rating opportunity.
Visit frequency	How many times users open the app and interact with your contents? The fact that they have the app installed in their smartphone is useless if they just open it once and for all. Hold frequency in check; the usage during the first week is a plausible signal of what will happen in the future.	If the user really wants to use recommendation to organise the own events, the app should be used on a daily base. The questionnaire will consider the usage of the app and give an appropriate rating opportunity.

9 Summary

This document describes the ALFRED apps, related to the Pillar I:User-Driven Interaction Assistant and included in the scope of the task T4.5. The main goal of this task is to provide to the end user five apps focused in the use of the speech recognition and the text to speech, in order to make easy its usability and comprehension by the older people. Chat app implements communication functionalities with other persons, Help app allows support in case of emergency, News app gives some information about the latest news, Questionnaires app initiates some dialogues for providing to the user some interesting information classified by categories, and finally Tutorial app introduces the older end user in the operation of the ALFRED Asisstant.

This deliverable states the established and executed processes during the last months, in order to improve and to guarantee the integration with DDD and the CADE component.

This deliverable includes these apps, and the corresponding DDD. Some of these apps are integrated with the smartphone contacts, although they are ready to be integrated with the Personalization Manager component in future versions.

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