

ALFRED

Personal Interactive Assistant for Independent Living and Active Ageing



WP5 – Pillar II: Personalized Social Inclusion

D5.5.2 – App Building and Deployment

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This deliverable provides a description of the app implementation of Task 5.5 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. The focus is on the adaptations since the last report in T5.5.1. It specifies how to install and execute the apps, that are integrated in the Personal Assitant (PA).



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This deliverable is subject to final acceptance by the European Commission.

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Executive Summary

Older people tend to get lonely for reasons such as their declining health condition and death of friends or relatives. The ALFRED system will reinforce the social inclusion of older people by providing personalized recommendations for social events. In the task for “Society Participation Recommendations” 5.5.1, different functionalities for the social inclusion of older people are added to the ALFRED system.

In the scope of WP5, five apps have been developed and described in D5.5.1 to fulfil the requirements of the event recommendations as stated in US072, US073, US074, US080, US81 and US103. In D5.5.2 the focus is on the additional work on those five apps in order to improve all apps in terms of performance, reliability and usability.

The deliverable shows concrete screenshots of our apps with real life examples and explain concrete changes that were applied.

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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 app implementation of Task 5.5 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 (PA). Last but not least, 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 final state in the apps developed related with WP5 Personalized Social Inclusion based and using the components developed in previous tasks.

1.3 Document Status and Target Audience

This document is listed as “public” in the Description-of-Work (DoW), as it provides general information about ALFRED’s software extensions. While the document mainly aims at the project’s contributing partners, this public deliverable can also be useful for the wider community. 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 event recommendation functionalities and social contacts in the ALFRED system. Focusing on the client side solution of the the Recommendation Engine (REn), two apps are explained. Furthermore the synchronization of contacts between ALFRED and the Android system is explained. Finally, this section will present the apps for social groups and the organization of meetings.
- **Chapter 4** presents readers with 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.
- **Chapters 7 & 8** are concerned with the evaluation of the prototype and discuss the test plan and the target performance respectively.
- Finally, **Chapter 9** summarizes the aforementioned content.

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2 Context and Scope

The Social Inclusion pillar of the ALFRED project is the focus of WP5. Many older people are at risk of social exclusion and loneliness due to a declining health, reduction in mobility and death of partner or friends. The ALFRED app will reinforce the social inclusion of older people (i.e. its users) by providing personalized recommendations for social events. The personalized recommendations will be based on users' personal and health profiles, their context (e.g., location, interests), their social circle and events they attended to in the past.

The "App Building and Development" task, is in charge of developing the client side, making it possible for users to interact with the ALFRED recommendations. As stated in D5.5.1, there are five Android apps. Two are used to communicate with the Recommendation Engine (REn) for events, one is used to setup social groups, another one to schedule appointments and the last one to manage contacts stored on the Android device and in the ALFRED infrastructure.

In D5.5.2 the apps have been improved in terms of functionality performance and style of the Android UI's such that the design meets the requirements stated in the mockups. Furthermore, the handling is easier and the CADE commands have been adjusted in order to make the dialogs easier to control.

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3 State of the Development

Task 5.5 includes for the development of five different apps. Therefore, this chapter is divided into subsections in order to separate all of them.

All apps require a login by using the ALFRED Profile app, to get the technical ID of the user. This id is used in order to personalize the information displayed to the user. Furthermore, all apps require full Internet access in order to download the required information from ALFRED webservice.

3.1 Apps for Recommendations

For the Society Participation Recommendation task two components are required. On the server side, the Recommendation Engine (REn), which is seen as part of the Personalization Manager (PM) and secondly, an extension of the Personal Assistant (PA) on the client side.

This document focuses on the client side and both Android apps that are developed within this task.

There are two apps to fulfil different user stories. The first app (ShowRec) covers US072, “As an older person I would like to use ALFRED to learn about art expositions or a museum”. The app is therefore used to display recommendations and events to the user. The second app (RateRec) covers US073, US074, US080, US081 and US103. The app is used to request a rating and a conclusion from the users. The feedback is afterwards used to improve the recommendations provided by the REn.

Since the last status stated in D5.5.2, the design of the Android UI has been improved in a way such that the design meets the requirements stated in the mockups. Furthermore, the handling is easier and the CADE commands have been adjusted in order to make the dialogs easier to control. Figure 1 shows a screenshot for the Eventrecommendation app on an Android device with one event. The app can be started by various commands like “Show recommendations” or “Show next ten recommendations”.

U> show recommendations

S> Here are the recommendations for the next 10 events.

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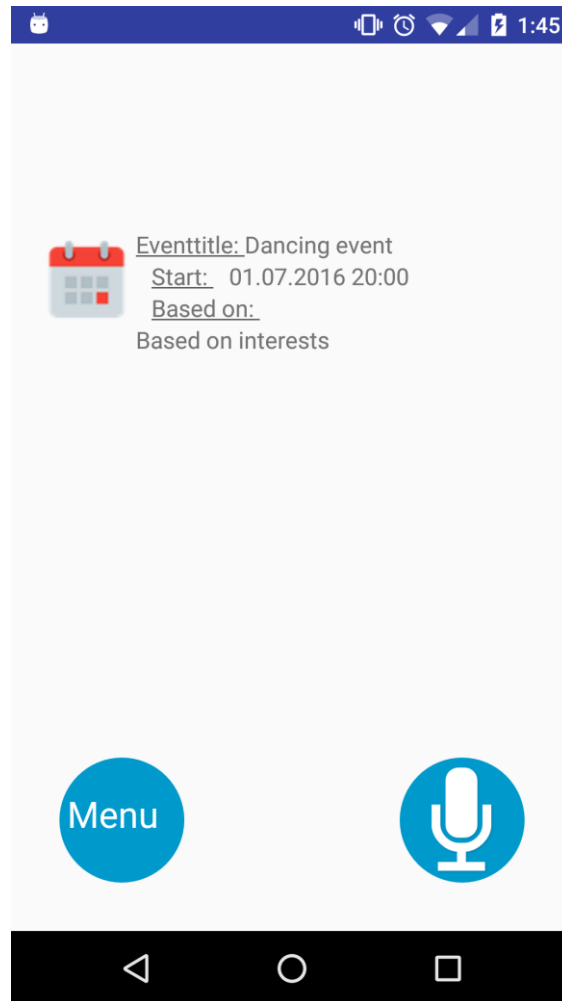


Figure 1: Eventrecommendation App – Overview

The event is shown with the most important information like the title, the date and time and the criteria why the event has been chosen. According to D5.5.1, the events are based on the users interests, location and social relations such like friendships. Those criteria are shown for each event as the last point in the list.

The user is able to interact with the dialog to see details for a certain event. The selection is based on the event's position in the list:

U> show recommendation details

S> What is the number of the event?

U> 3

S> Here are the details for the recommendation number 3.

The user gets the screen shown in Figure 2.

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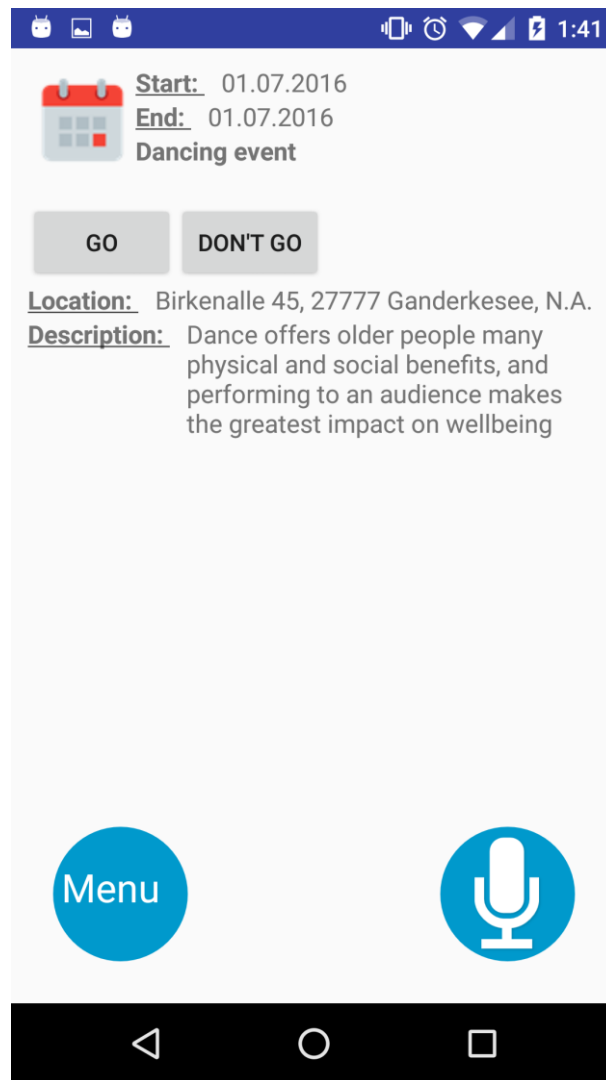


Figure 2: Eventrecommendation App – Detail View

In addition, the concrete event description is shown to the user and the user has the opportunity to accept or reject the event. Unlike what is stated in D5.5.1, the UI for the second screen has been changed. D5.5.1 had a mockup, which showed a lot of information for a certain event. The screen was full with information and the text was structured by just using different font styles. A decision to keep the information to a minimum in order to make the dialog easier to use has been taken.

The user is able to accept (Go) or to reject (Don't go) the event. If the user accepts the event, a new event is created on the server site. With this, the recommendation engine in D5.4.2 is able to use this information in order to find good events for a certain user. If the user rejects the event, the event list (first screen) is displayed again. Even in this case a response is sent to the server in order to improve future recommendations and to enable notifications for other users.

Of course it is also possible to use CADE to accept and reject events. An example would be:

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U> participate in event number 3

S> You are now participating in the event number 3.

Based on US074 “As an older person I would like to use ALFRED to get a personalized invitation to a social event, so it motivates more to go” and US081 “As an older person I would like ALFRED to enable me to have face to face contacts as well, not just virtual contacts over ALFRED”, the REn calculates recommendations based on social contacts in order to create personalized notifications for friends and social contacts of a user. This notification is based on the feedback of users as stated above. The REn creates a notification that displays a message like “Your friend is joining an event at 1 PM for 45 minutes. Would you like to join”. The notification is shown in the Android status bar. By starting the Eventrecommendatoin App, the event is displayed to the user.

A rating of events is important in order to improve the recommendations. Therefore, the user is asked for a rating based on stars where five stars mean “very good” and zero means “very bad”.

This also simplifies the integration of CADE. The screen layout is very close to the layout stated in D5.5.1 and it is shown in Figure 3.

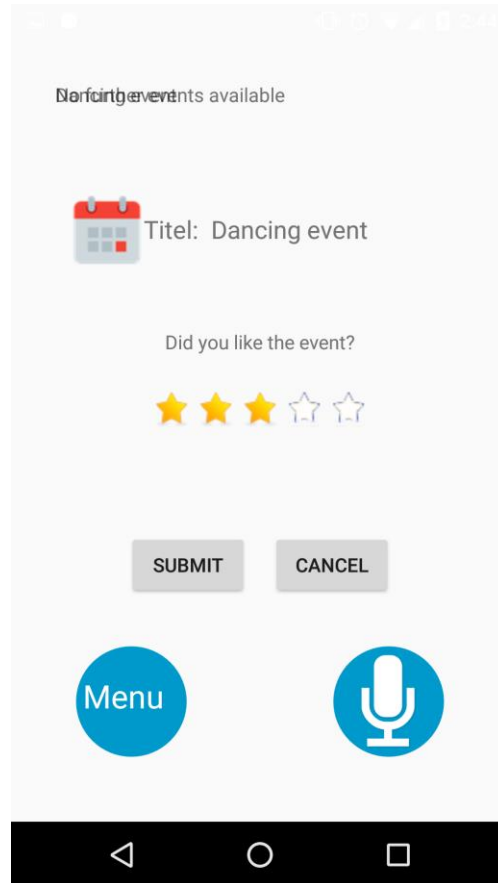


Figure 3: Event Rating App – Overview

Again, various CADE commands have been implemented in order to use the dialog.

U> let me rate my event

S> How many stars you want to give to the event?

U> 4

S> Your event was rated with 4 stars.

The feedback is given to the server again in order to allow the REn to calculate more accurate recommendations next time.

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3.2 Setup of Social Groups

The app for social groups has been developed to meet user story 78 “As an older person I would like to use ALFRED to setup social groups of people with similar diseases”, the user can create an ALFRED group with a dedicated subject. Other people from the ALFRED ecosystem can join such a group.

A group has an owner, the user, who has created the group.

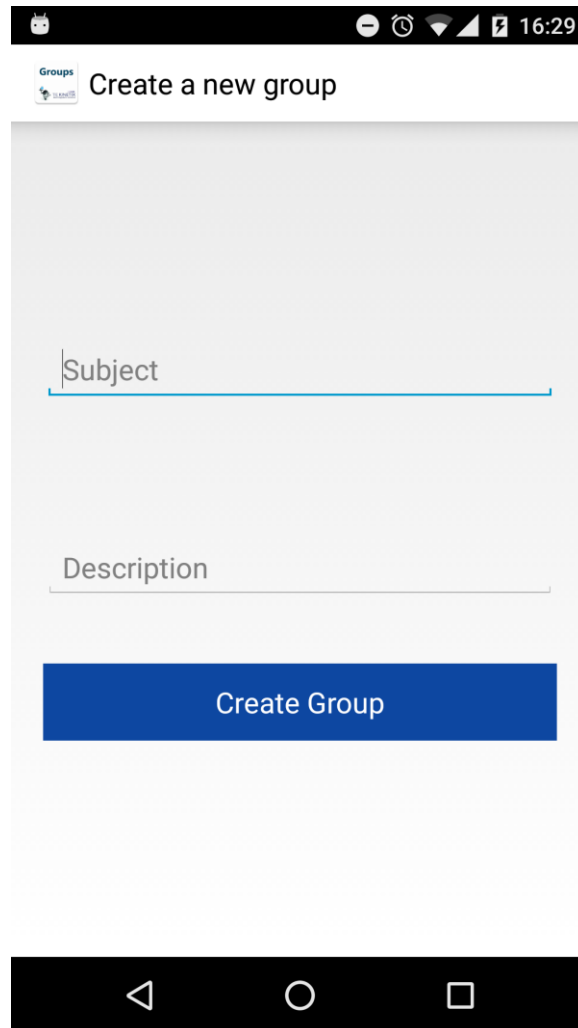


Figure 4: Social Group App – Create a Group

Using CADE or gestures, the user can create a group or lookup for groups as well as join an existing group.

3.2.1 Create a Group

A user can create a social group within the ALFRED ecosystem. The user has to add the following attributes as shown in Figure 4:

- Subject, defining the theme (e.g. disease)
- Name (e.g. which disease it is about, together with another naming)

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When creating a group, the date and user-ID will be added to the group object within the server component.

An example for a CADE interaction would be the following:

U> create a group

S> Which name do you want to have for the group?

U> rheumatism

S> What is the description for the group?

U> all about rheumatism

S> Group rheumatism with description all about rheumatism has been created.

All CADE commands are well tested by using the integration tests for our CADE environment.

3.2.2 Lookup and Join a Group

Users can search for existing groups, he/she is not yet a member of.

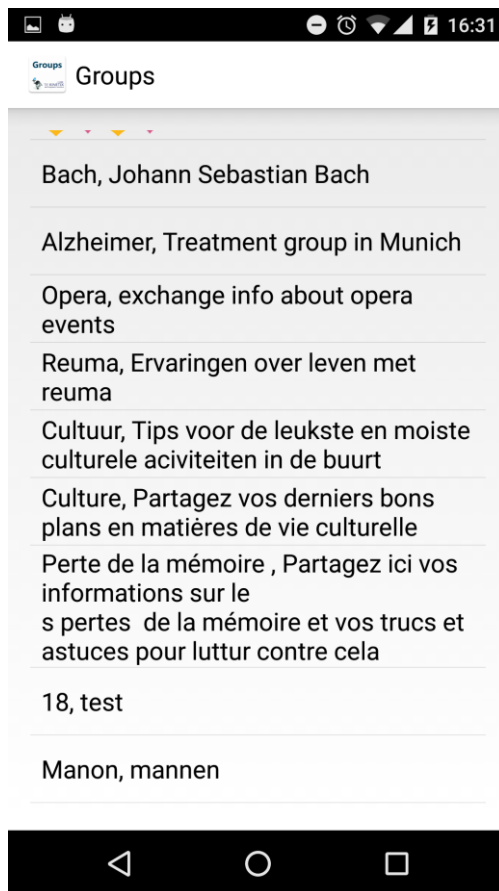


Figure 5: Social Group App – Search for Groups

Users can join any existing group, they not yet a member of. A user is now able to select a group and having pressed the button “Join this Group”, the user will become a member of that group and the screen of Figure 7: Social Group App – Overview will be displayed.

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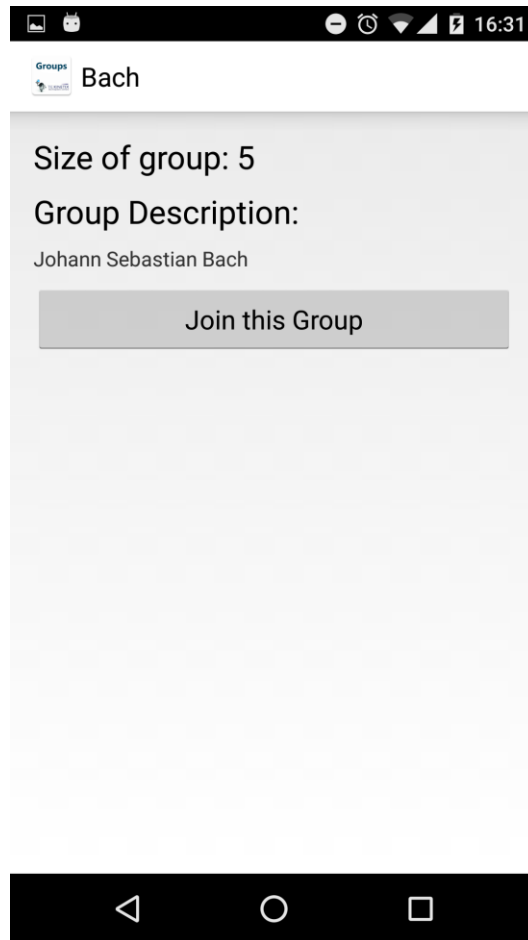


Figure 6: Social Group App – Join a Group

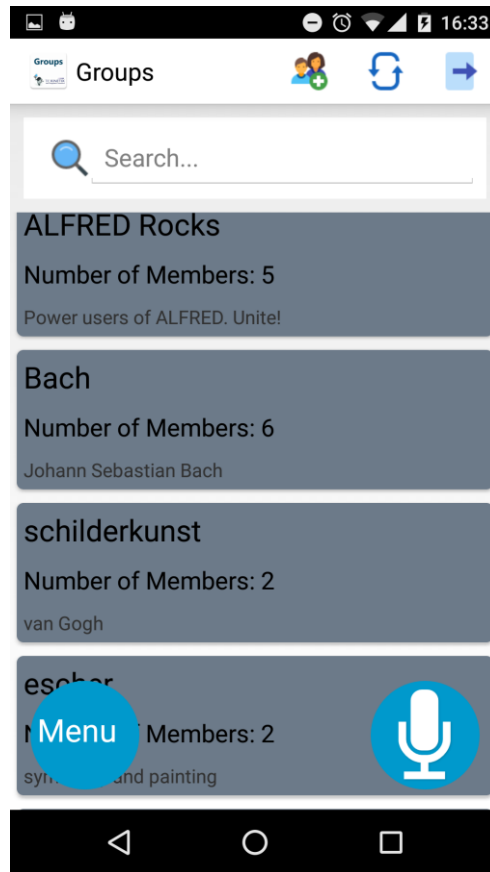


Figure 7: Social Group App – Overview

3.3 Organize Meetings with Other ALFRED User

User story 078 “As an older person I would like to use ALFRED to organize a meeting with a group of friends at a certain place” is similar to a calendar entry of a mail-client. A user can enter a date/time, a location and she can select ALFRED users from her list of contacts (from Personalization Manager).

In D5.5.2, improves the Android UI in order to meet the requirements stated in D5.5.1.

The Personalization Manager has successfully extended in order to include other contacts and tested this with our next version of the meeting app.

CADE has also been included, so it is possible to schedule meetings by using commands like the following:

```
U> setup meeting
S> Which year are we talking about?
U> 2016
S> Which month are we talking about?
U> may
```

S> Which day of month are we talking about?

U> 20

S> What is the subject of the meeting?

U> going for launch

S> Which location do you want to have for the meeting?

U> whisky bar

S> Invitation to your meeting has been sent may 20 2016 subject is going for launch and location is whisky bar.

The meeting form is filled like shown in Figure 9

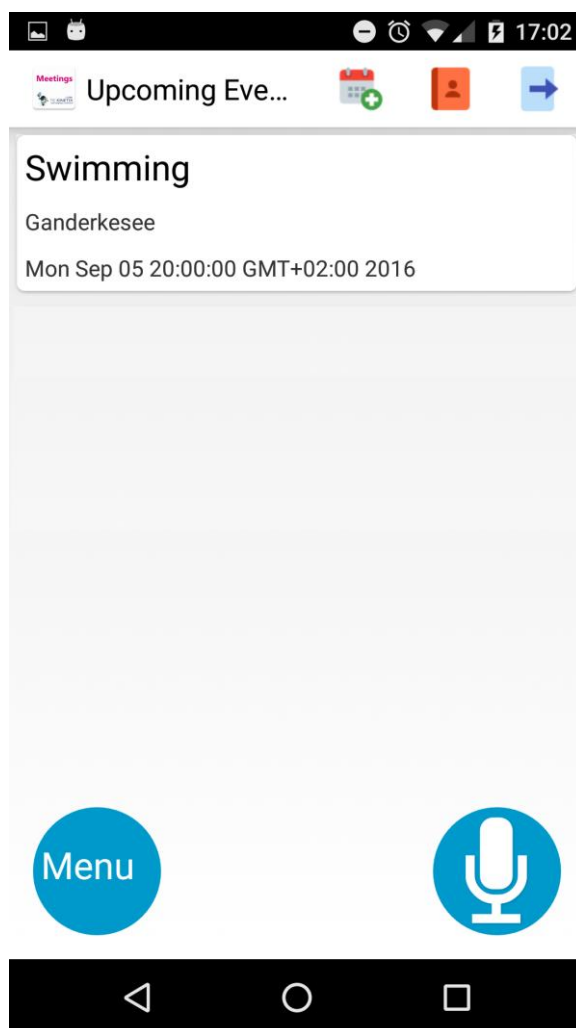


Figure 8: Meeting App – Organize a Meeting

Figure 9 also shows the possibility to add ALFRED contacts to the meeting.

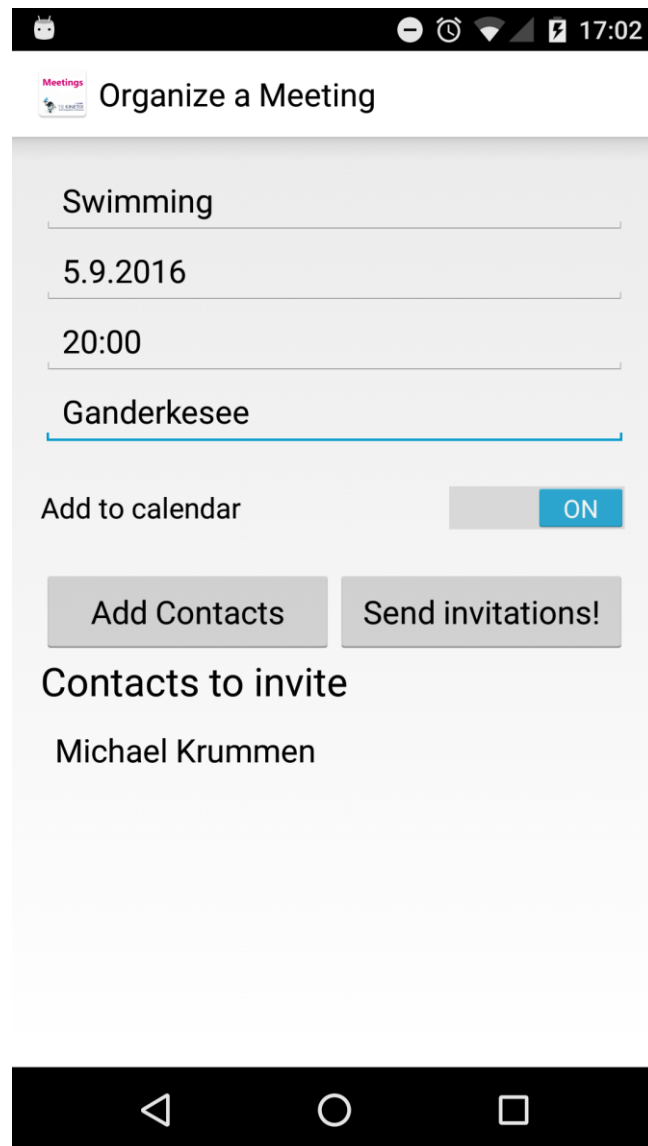





Figure 9: Meeting App – Create a New Meeting

The properties of a meeting are filled and the user is able to select multiple contacts to join the event.

3.4 Synchronization of User Contacts

US064 describes the ability of the user to synchronize contacts of the ALFRED system with the Android system, so the contacts are stored in the regular callbook. This is important in order to avoid redundancy and to make the usage of the system easier and centralized. Figure 11 shows the screen for the app in order to fulfil US064. The app screen has been developed according the mockup stated in D5.5.1. The centre column indicates the status of the synchronisation as appears in Table 1.

Table 1: Meaning of Status Icons

	Mapping of both contacts is ok
	A mapping is probably found , but the user has to verify this.
	A mapping is not possible

The automatic mapping has been improved in order to use phone numbers and the name. To enable the user to perform an individual mapping, a second Android activity is required and shown in Figure 12.

The app can also be controlled by CADE, using the following example:

U> compare contacts

S> How is the contact called?

U> John

S> Here is your contact comparison of contact John.



Figure 10: Contact Synchronize App – Splash Screen

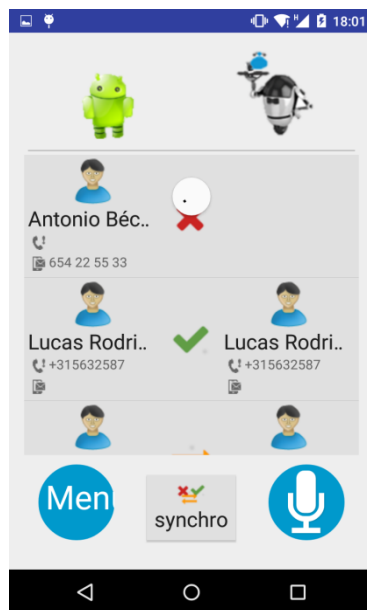


Figure 11: Contact Synchronize App – Synchronize Contacts¹

The screen in Figure 11 shows both contacts again in the upper area. A spinner is shown while the lists are being retrieved. Also, this view can be refreshed by the usual swipe refresh over the list.

¹ The Similey is a Placeholder for the Users Profile Picture

To create a correct mapping, the user has to select the correct properties from both contacts. In Figure 12, the user has chosen the image and the phone number of the android contact, but the mobile phone number and the name have been chosen from the ALFRED system.

The lower part of the screen shows the result of the mapping. Here the new user, that will be created during the process, is shown. The process can be finished by using the according controls at the bottom of the screen.

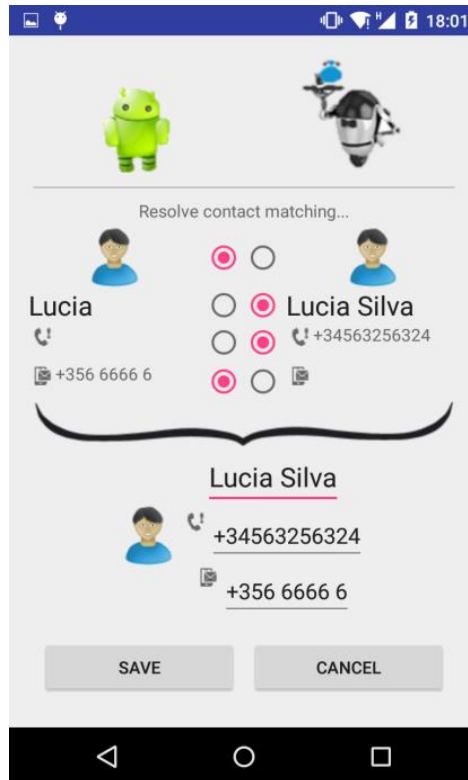
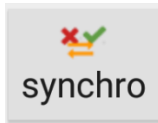



Figure 12: Contact Synchronize App – Manual Mapping of Contacts²

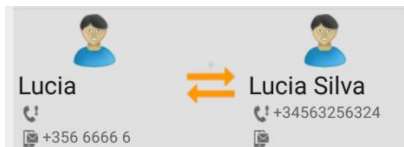
² The Similey is a Placeholder for the Users Profile Picture


User can interact with the application in this ways (See Figure 11):

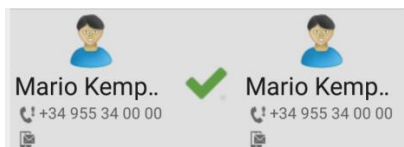



All contacts that are not present in the other system will be created. So Android contacts with an **X** on the right and Alfred contacts with an **X** on the left, will be inserted in Alfred and Android, respectively. This will be a batch of operations, a progress indicator will show how the process is being executed.

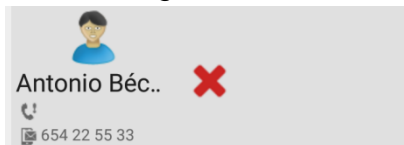
User will have to check individually contacts paired and marked as .



A pair of contacts that the app considers could refer to the same contact are show with a  symbol that opens a new activity and permits the manual mapping of the contacts.



A pair of contacts that are present in both systems does not provide any behaviour, so selecting  will have no effect.



When a contact only appears in one of the systems, selecting the **X** symbol will open a new activity that lets the user add the contact individually to the other system, if he does not want to perform a full contacts synchronization.

When selecting the command *synchronize all*, a confirmation dialog will ask for the operation to be done. Clicking in the button or by voice command, the user can accomplish this.

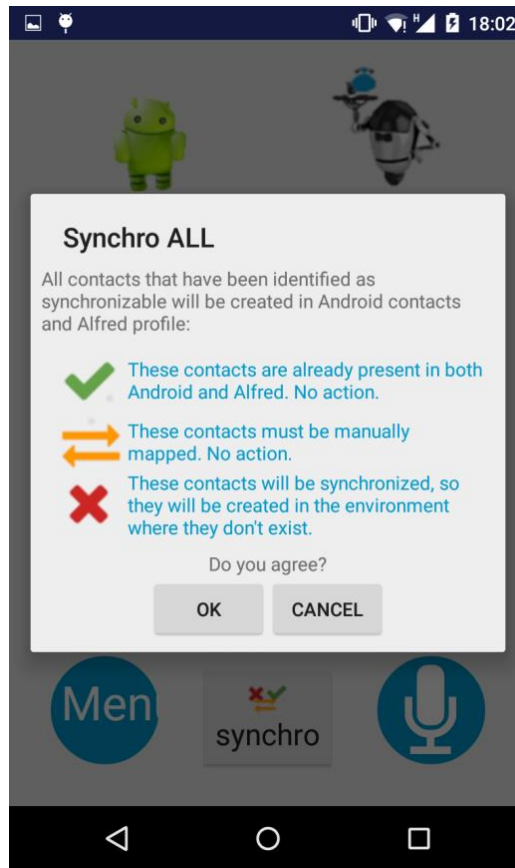


Figure 13: Contact Synchronize App – Synchronize All

When selecting a contact that was not paired, user can export it individually to the platform in which the contact doesn't exist. Figure 14 shows an example for this.

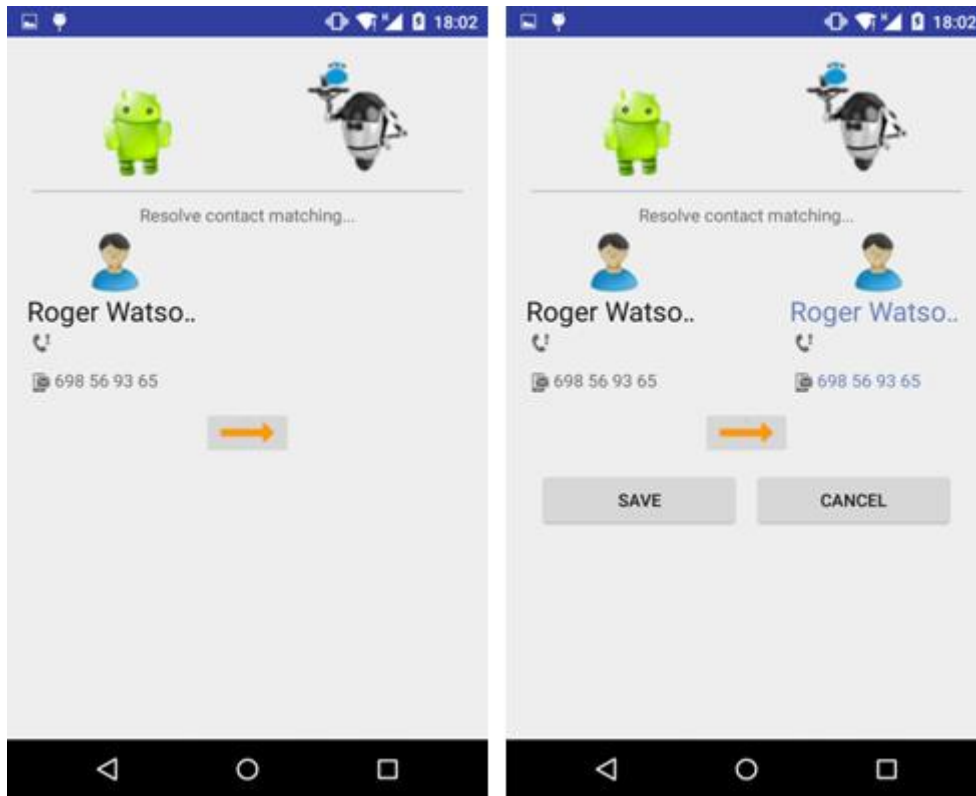


Figure 14: Contact Synchronize App – Copy a Single Contact

4 Requirements and Preparations

From a system viewpoint, all apps have been developed and tested on a Nexus 5 Android smartphone with stock firmware and API level 19.

All apps are available within the ALFREDO marketplace.

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5 Deployment (Installation)

The application is installed via the ALFREDO marketplace.

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6 Execution and Usage

The app is included in the Mobile Assistant Foundation / Personal Assistant Service. There is no direct communication with any webservice of the ALFRED infrastructure. Every webservice call is evaluated and wrapped by the Personal Assistant Service.

All apps are started on demand and used based on the users need. Furthermore ShowRec is able to receive push notifications in order to suggest events on demand.

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7 Test Plan

All apps are tested on a low level by using functional tests for the core app functionality and by using integration tests to ensure the communication with the Mobile Assistant Foundation / Personal Assistant Service.

The speech input using CADE can be tested as stated in D3.3.2. Here, we developed iteration tests based on the CADE interfaces to check whether the grammar is correct.

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8 Target Performance

Table 2 lists the defined key performance indicators (KPI) for this component:

Table 2: Key Performance Indicators

Topic	Description	Target KPI
Ease of Use	Ease of use is an important topic and performance indicator for this component. Each component owner 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 component 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 deliverable presents the state of progress in T5.5, which deals with the app building and development for WP5. The deliverable includes screenshots of the real app implementation and shows the improvements in comparison to D5.5.1

There are five apps in WP5. Two of them are dealing with event recommendations for the user. Here, the first one gives the opportunity to download a list of personalized recommendations and to accept events. The UI has been adjusted in order to focus on the most important information and to handle the changes made in the recommendation engine. The second app is used to give feedback for an event. This app hasn't been changed again, as it already fulfilled all requirements stated in D5.5.1.

The third app allows the user to create, manage and join individual groups of users. Again, the functionality of this app has been improved in order to fulfill the requirements stated in D5.5.1 and the fourth app allows to organize meetings with various ALFRED users.

The fifth app is used to synchronise ALFRED contacts and the contacts stored on the smartphone. The quality of the synchronisation and the handling has been improved. Furthermore, the integration with the ALFRED system has been finished.

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