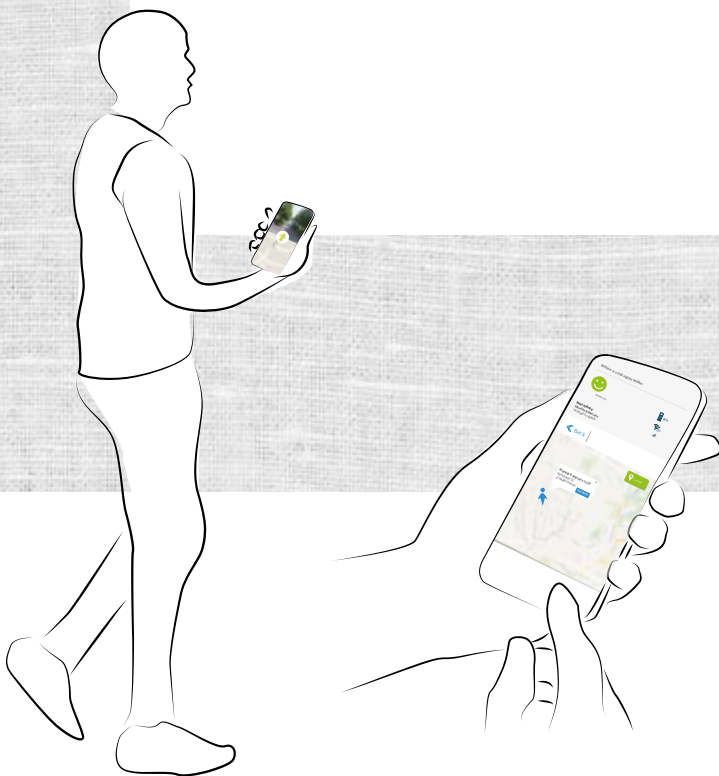


Design Happy Walker

Based on a user centered design approach

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This document presents the design of Happy Walker, as developed in the AAL project Happy Walker and the project Happy Walker Outstanding funded by ZonMw.

Happy Walker

The Happy Walker service consists of two applications. The first is the Happy Walker application which is a navigation support for a person with dementia during walking. The other application is a mobile app for the informal carer (IC) to set-up the Happy Walker app. This IC app is developed to make the application for the person with dementia (PwD) low in complexity and compatible with their abilities. These two different apps were developed in the Happy Walker Outstanding project. Users rated these applications as valuable.

The different steps which have led to the design of Happy Walker are described in the publication about the user-centred (a publication in Dutch). The design choices in the product development are based on the evaluation by users, both people with dementia and informal caregivers are consulted in user research and evaluation sessions.

This document explains the general design of the Happy Walker applications and specific design choices for people with dementia. The choices are explained per theme and visualized by screenshots of the applications.

As with any design, further development is always relevant and continuous involvement of the end-users is also needed for the actual release of Happy Walker. We have the confidence, based on all user research that has been performed, that Happy Walker will support in the way it is required with the design that is proposed in this publication.

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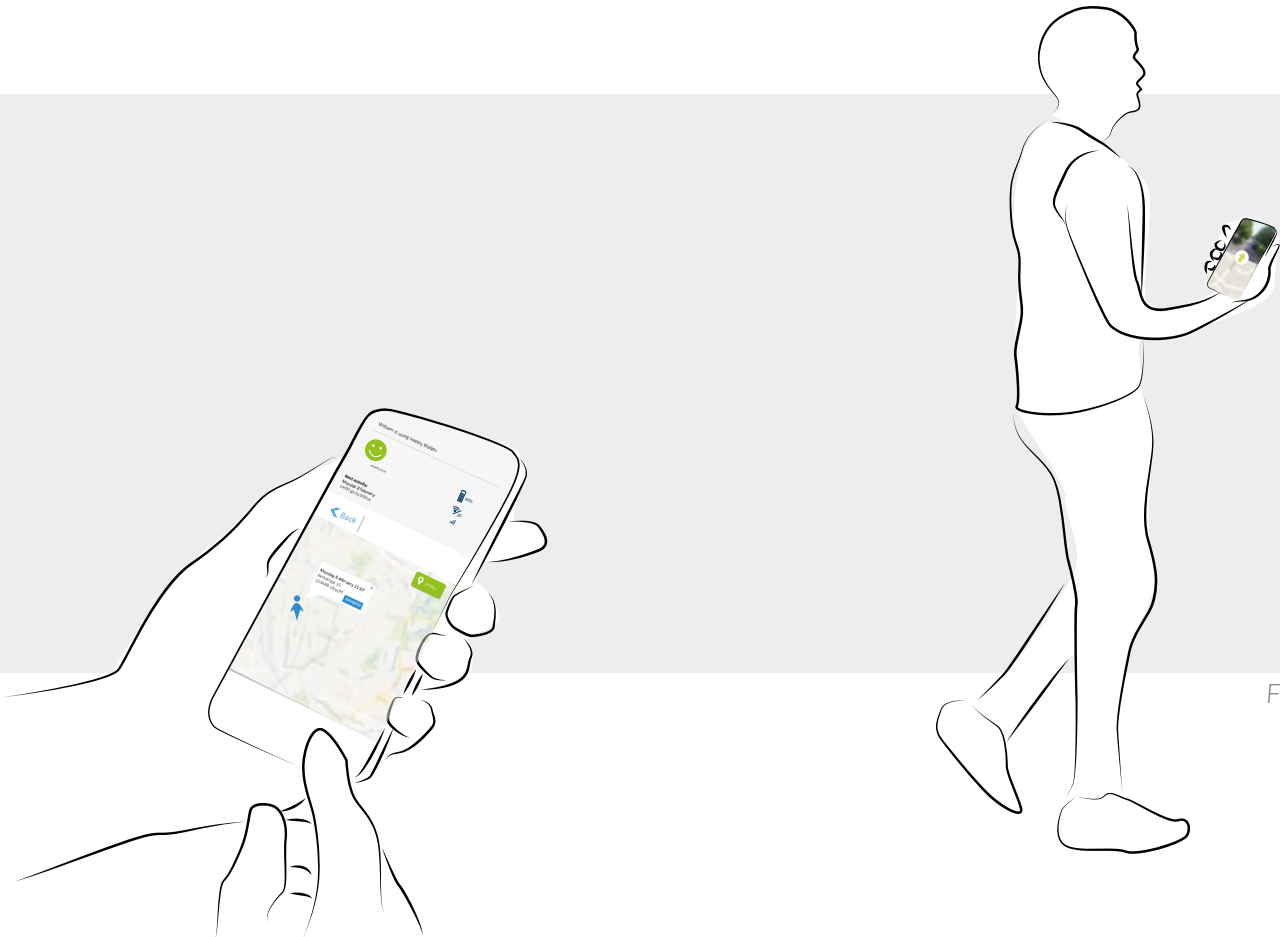


Figure 1

GENERAL DESIGN

During the design process requirements are made based on extensive user research. Some general remarks about the design of similar smartphone applications for seniors can be concluded.

Design of buttons

Buttons are key elements for user input in user interfaces. There is already much known about appropriate button design. In the Happy Walker project we found additional insights on the design of buttons for seniors and people with mild dementia. It is very important to make clear which elements of the interface are buttons one can use to navigate in the app and which elements are just information. By making use of paper prototyping and testing different types of buttons and observe the use of the interface, it became clear that a shadow and arrows on the button help to understand that the element is a button. Participants in the user research of the Happy Walker project seem to be focused on the arrows in the button design. They deem to press these arrows when using the interface, indicating that it helps them to understand the navigation inside the app. Because the 'Back'-button has arrows pointing in the opposite direction, we assume this contributes to the general understanding of inside app navigation.



Figure 2

Use of text in the interface

App design usually contains many icons. The use of icons saves precious interface space, which is limited in a smartphone screen. Users who are familiar with using apps and computer interfaces might recognize standardized icons such as the hamburger menu. In the Happy Walker project we found that seniors and especially people with dementia are focused on text in the interface. They read this very carefully and act upon. For example in the navigation screen there is a text "Follow the green arrow". Most of the participants read this out loud and they seemed confident in how to use the elements in the screen. For both the informal caregiver and the person with dementia text on buttons was preferred to elucidate functionalities. Therefore the design proposes the use of wording such as "Back", "Go Home" and "Calling".

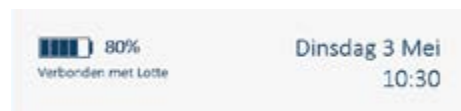


Figure 3

Another aspect related to the use of text for this particular user group, is that the use of abbreviations is not desired. For example the day should be fully written; "Monday" instead of "mon."

Finally the words that are used in the interface should be as simple as possible. When there is no GPS connection it should not be displayed as "No GPS" because this sentence does not help the user (the person with dementia) understanding what to do. In this case the design proposes to give the user an idea how to improve this situation: "There is no signal. Walk a few meters or call the informal caregiver".

For the app of the informal caregiver the words should be clear as well. Because of the connection between the two apps, which is rather difficult for this user group to fully understand, wording can be helpful to be aware that the user's input in the IC app is resulting in an action on the Happy Walker app. The word "Localization" was relatively hard to understand. It is assumed that "Where is Happy Walker?" makes the function of locating more clear.

Use of icons

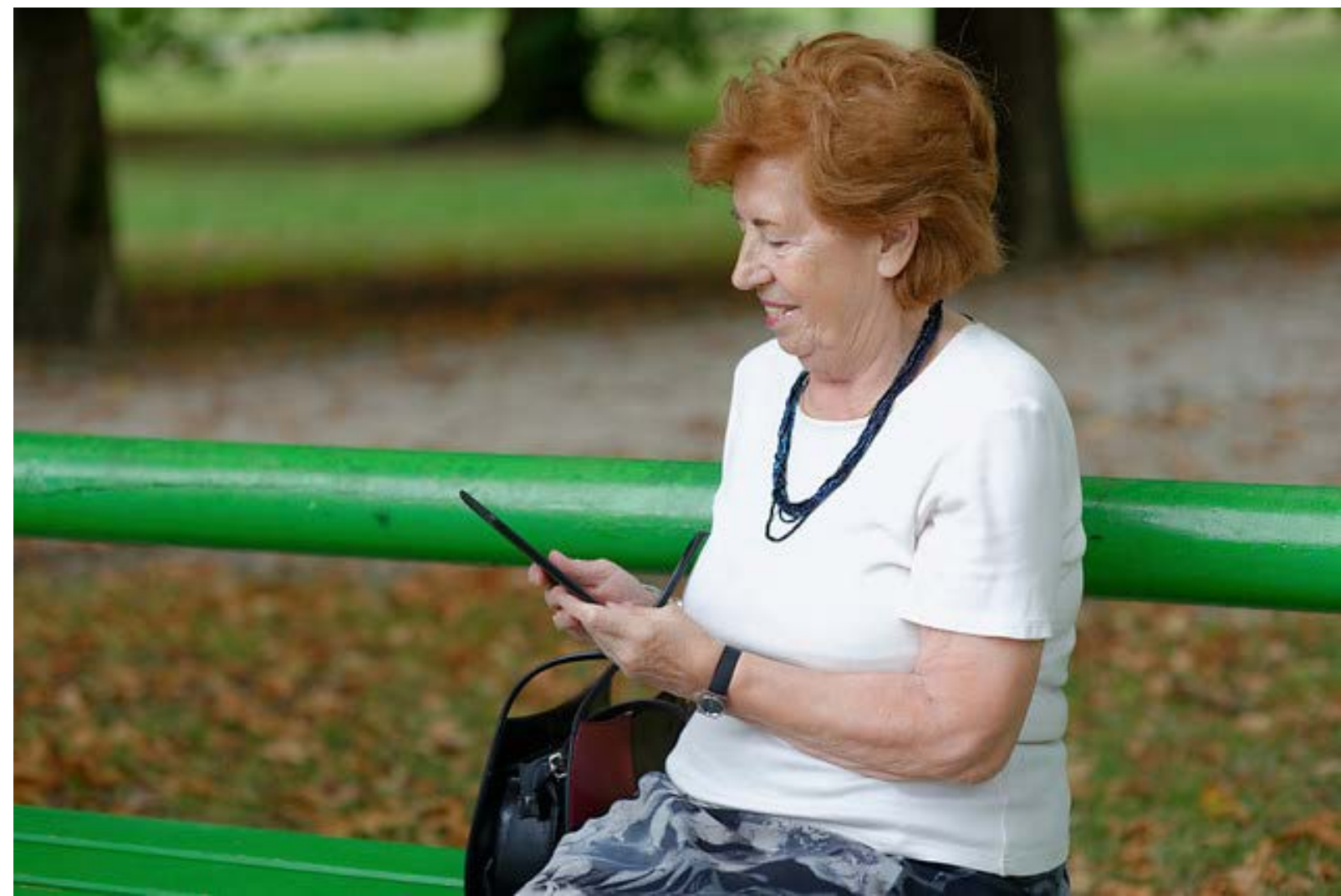
It is not possible to only use text in buttons, because it costs a lot of space. Besides, it can make the appearance of the app clutter which makes it difficult for this user group to interact with the application. Simple icons are used to clarify functionalities and information in the interface. These are tested with people with mild dementia and are understood.



Figure 4

Colors/ contract

In the design of the interface, colors are chosen based on end-users preferences and the high contrasts of these colors (e.g. dark blue on white background). In some cases green is used to make a button more prominent in the interface and draws the attention from the user.



HAPPY WALKER

Click on the picture to see a clickable PDF demo of the Happy Walker. The demo is in Dutch since the latest user research is performed in the Netherlands. Therefore, choice of words is based on the input of Dutch participants.

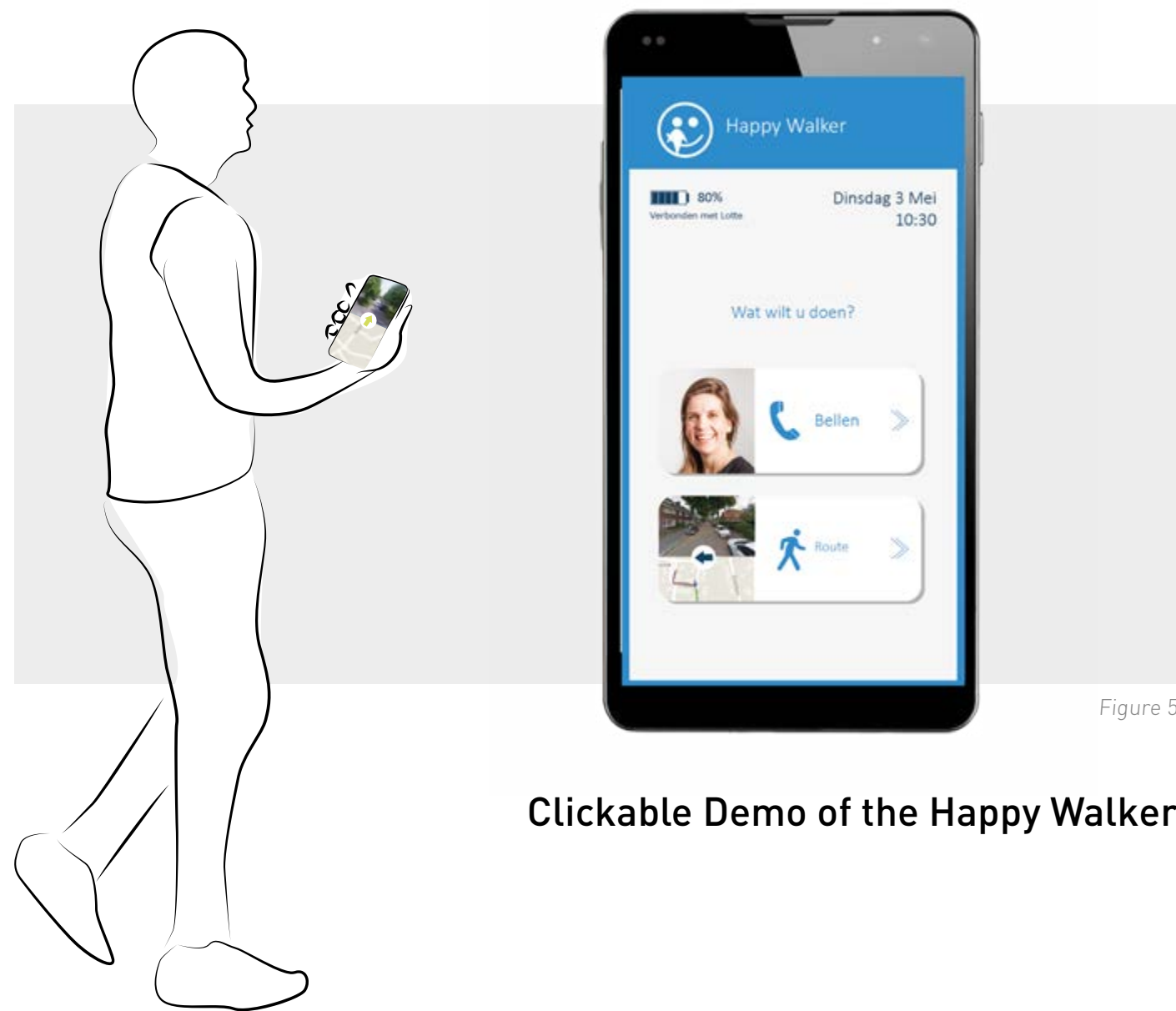


Figure 5

Clickable Demo of the Happy Walker

Function Happy Walker

Happy Walker is the application for people with mild dementia. This application is designed with a minimal amount of screens and a minimal amount of input needed from the user. The goal of Happy Walker is to create a navigation support for people with dementia during walking to their homes or predefined locations. Navigation is therefore the main functionality of the app.

Navigation

The navigation functionality presents the right direction by use of an arrow, landmark photo and map. Based on the settings in the IC app, the person with dementia can navigate home and to destinations predefined by the informal caregiver.

Calling the informal caregiver

The Happy Walker contains a straightforward functionality to call the informal caregiver. The functionality of calling is available in both the main menu and the navigation screen. The latter placement of this functionality is in case the user wants to connect to the informal caregiver easily during a walk (in case of e.g. an emergency).

Sending a confirmation message.

The Happy Walker contains a functionality of answering an "Are you OK" message. An "Are you OK" message is meant to check if the person with dementia is doing well. The message is sent by the informal caregiver of the Happy Walker system. All answers of the person with dementia are sent to the IC application.

Interaction

In figure 6 the interaction scheme of the Happy Walker for the person with dementia is presented. As the picture presents a minimum amount of screens is needed for the functionalities that should be included in the Happy Walker.

Texting: Send an action to the informal care giver

Information from the Happy Walker is sent to the app of the informal caregiver.

There are two types of messages sent by the Happy Walker. One is the answer on the "Are you OK" message, given by the person with dementia. Other messages are sent by the system itself. This is relevant information for the informal caregiver but can be automatically generated by the data gathered by the Happy Walker phone. This limits the given input needed by the person with dementia. Examples of these messages are shown below.

Pop up

As already mentioned, the amount of screens for the Happy Walker app is minimized as much as possible. However, in line with existing design heuristics, it is needed to communicate to a user when an error occurs. This also goes for a person with dementia, therefore understandable pop-ups are needed.

Flex options

Flex options are the functionalities that can be added to the Happy Walker based on the personal abilities of the person with dementia. There are large differences within this user group because of different cognitive problems, the experiences with the use of a technical device and personal preferences. Therefore, flexible options are proposed. An example of these flex option is that a person with dementia has the opportunity to choose several predefined destinations himself instead of only being able to navigate home.

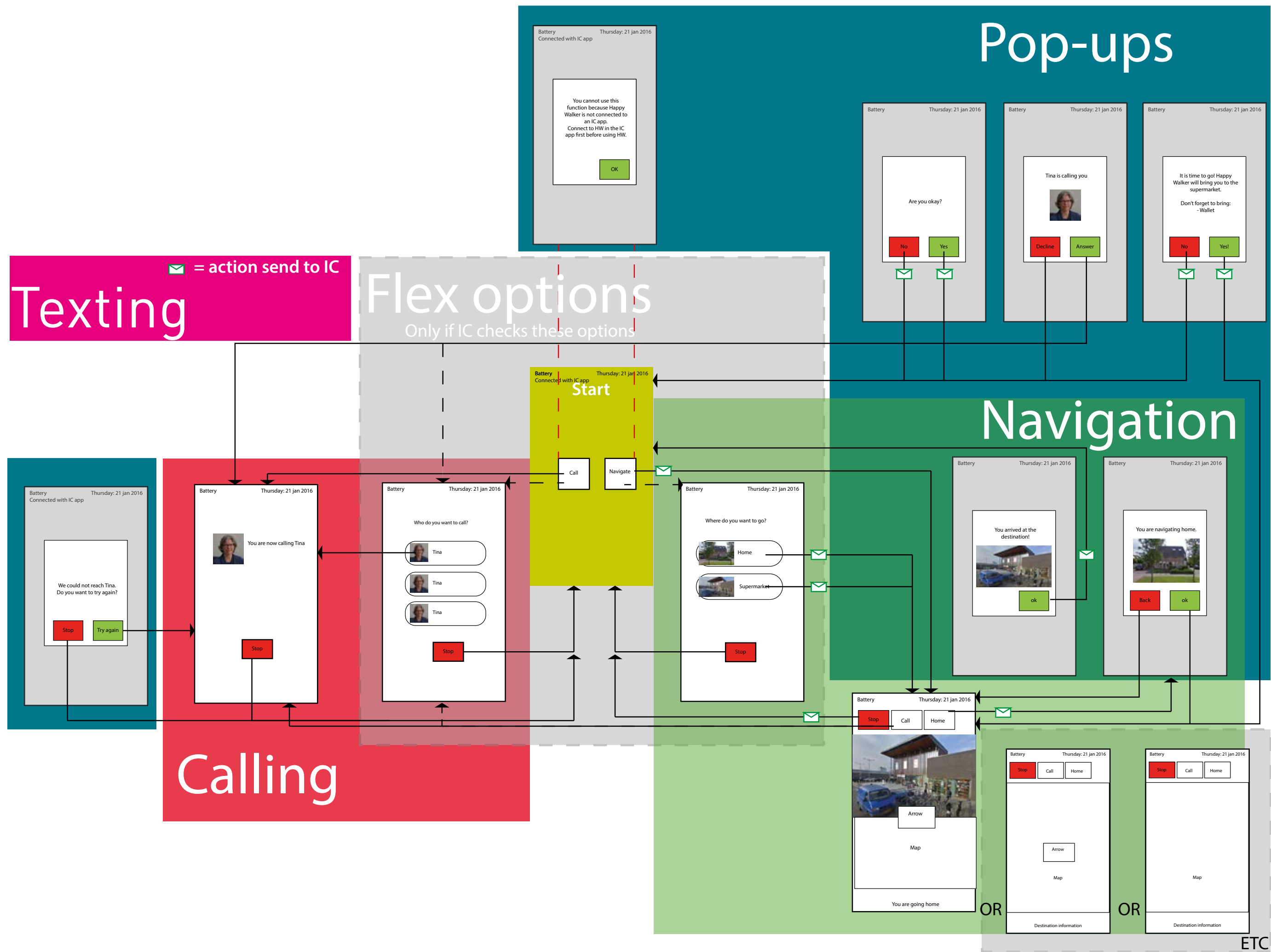


Figure 6

Design Happy Walker

The design of Happy Walker is explained by using the main screens of the application; the main menu, the navigation screen and a pop up. The Happy walker is installed on a smartphone in a way that only the Happy Walker application is accessible. This could be accomplished by using a dedicated device.

Device:

For the person with dementia it is not advised to use Happy Walker as an app on a regular smartphone. A dedicated device, a device with only the Happy Walker app running, is advised since the person with dementia should not have the option to leave the app and get lost in the interface of the smartphone. It is important that the device contains a large battery power and a good GPS connection. In the project the application is tested with a Samsung Note. During the test it became clear that a case to protect and wear the phone is desired by senior users.

Main menu

The design of Happy Walker is explained by using the main screens of the application; the main menu, the navigation screen and a pop up. The Happy Walker is installed on a smartphone in a way that only the Happy Walker application is accessible. This could be accomplished by using a dedicated device.

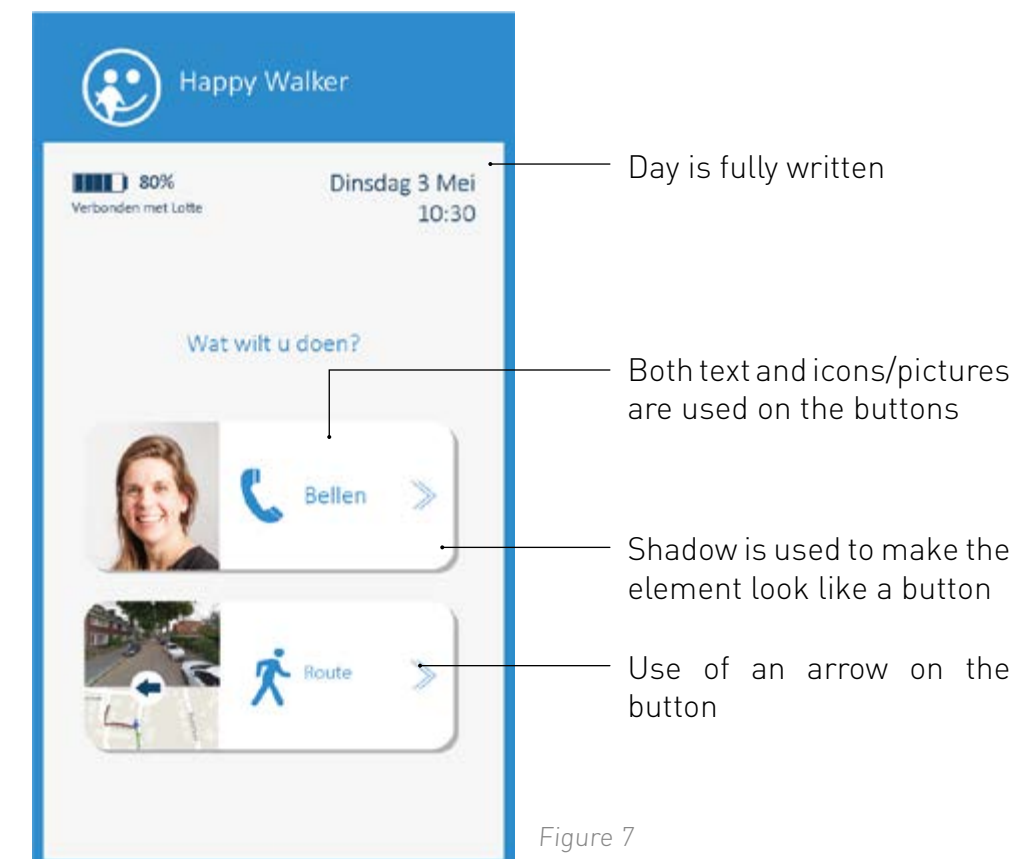


Figure 7

Map: The map gives information about the route by presenting the already-walked way in a red line (on the bottom) and the next directions in a green line (on top). During navigation, the map turns to have a left turn on the screen be redundant to a left turn in real life. However, it is important that this map is not continuously turning. It can be proposed to only turn the map after a user makes a turn and/or when a new photo is loaded in the screen.

Shadow is used to make the element look like a button Both text and icons/pictures are used on the buttons

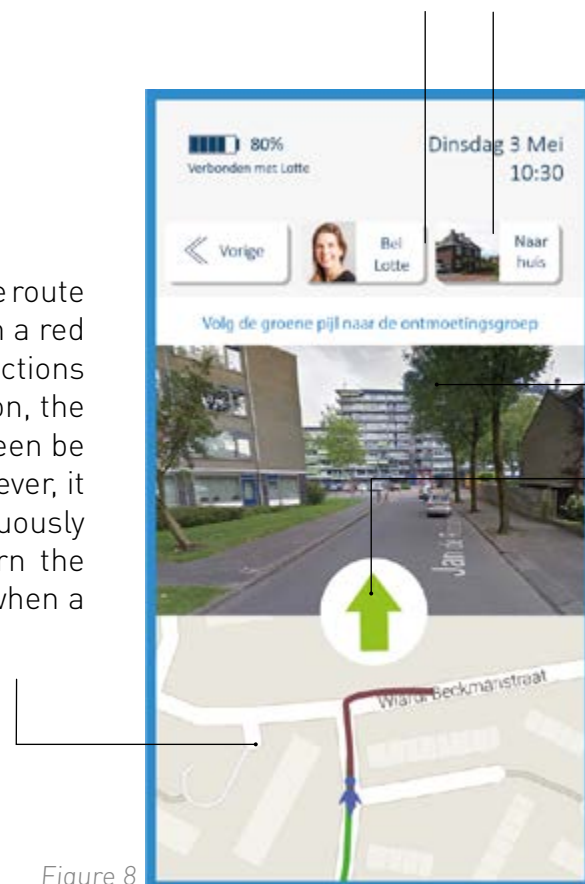


Figure 8

Navigation screen

The navigation screen consists of 3 elements: a picture, an arrow, and a map. The informal caregiver can choose in the IC app which elements are displayed on the navigation screen, based on the abilities and preference of the person with dementia. The navigation screen with all elements shown can be overwhelming for the user, but all elements can be helpful during a navigation task. When all elements are shown, the interface should not have extra animations (like fade-in of the landmark picture) to create the least amount of distractions.

Use of an arrow on the button

Pop Up "are you ok"

The "Are you OK?"-message is a popup message for the person with dementia. By choosing a smiley the person with dementia sends a message to the informal caregiver directly. To make this interaction as easy as possible, the design entails a red and green smiley. Furthermore it is advised to cover the entire screen to avoid clutter in the interface.

Landmark photo: the picture helps people during navigation. To make the photos as useful as possible, it should present the surroundings from the position of the person with dementia: from the sidewalk of the road. A car-perspective can be confusing for this user.

Arrow: In the middle of the interface a green arrow is used to designate the direction a user should take. Our user research showed that this arrow helps the person with dementia to find the right direction. The arrow should point into the direction some meters before the user actually chooses a direction. To make the navigation task more clear the text "Follow the green arrow" is presented on top of the navigation screen. This is according to the general findings that this user group is keen on reading texts in interfaces. For the design of the arrow the color green is chosen to seek the attention of the person with dementia. Furthermore the shape of the arrow is important, previous (more abstract) designs created difficulties.

Day is fully written

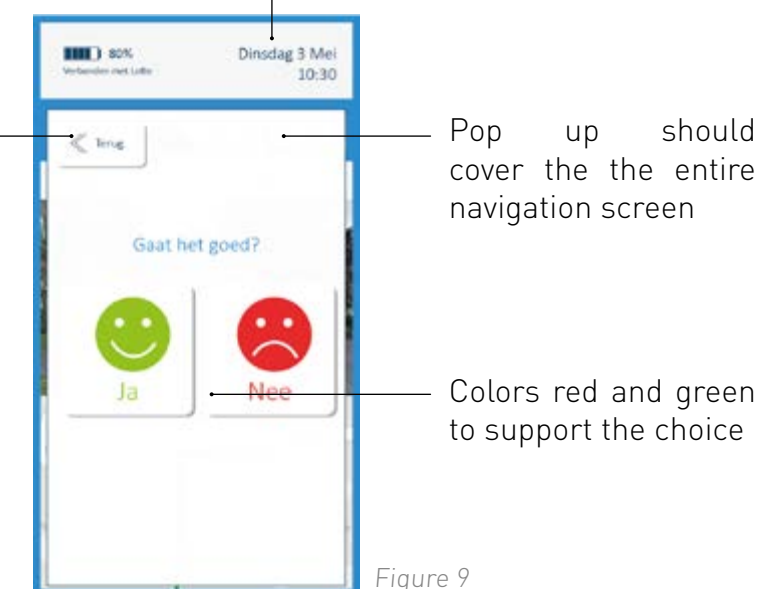


Figure 9

Pop up should cover the the entire navigation screen

Colors red and green to support the choice

APP INFORMAL CAREGIVER

Click on the picture to see a clickable PDF demo of the app for the informal caregiver. The demo is in Dutch since the latest user research is performed in the Netherlands. Therefore, choice of words is based on the input of Dutch participants.

Clickable Demo of the app for the informal carer



Figure 10

Functionalities IC app

The app for the informal caregiver is developed to reduce the amount of settings on the Happy Walker. Besides the possibilities to control the flex options in the Happy Walker, the IC application contains the well-liked localization functionality. The navigation task of Happy Walker is actuated from the planning route functionality in the IC app. Finally the IC app has several options to easily communicate with the person with dementia.

Next to these apparent functionalities, other functionalities might have an added value. For example the opportunity to make and collect pictures in the app which can be added to the route (own-picture functionality) or the opportunity to make rounded walking tours. It might be desirable to add a checklist for an activity. Further research with users is needed to see if and how these functionalities should be added in the Happy Walker services.

Overview of the status

Within the IC application the informal caregiver can receive status updates about the actual use of the Happy Walker, e.g. if the person with dementia is doing well. The status also contains information about the battery level and the connectivity (GPS, network) of Happy Walker.

Locating the person with dementia

The app contains a functionality to define the precise location of the person with dementia.

Planning a route for the person with dementia

The informal caregiver controls the navigation functionality. He/she plans a route which is directly sent to the Happy Walker and supports the person with dementia at the moment the walk should start. In the current version one route can be added.

Texting the person with dementia

The Happy Walker can be reached by a straightforward "Are you OK" message. This message can be sent by the informal caregiver. A reply message is sent with the answer of the person with dementia. If he/she is not answering, the informal caregiver is also informed.

Calling the person with dementia

The application contains a regular calling function to make a quick call to the person with dementia.

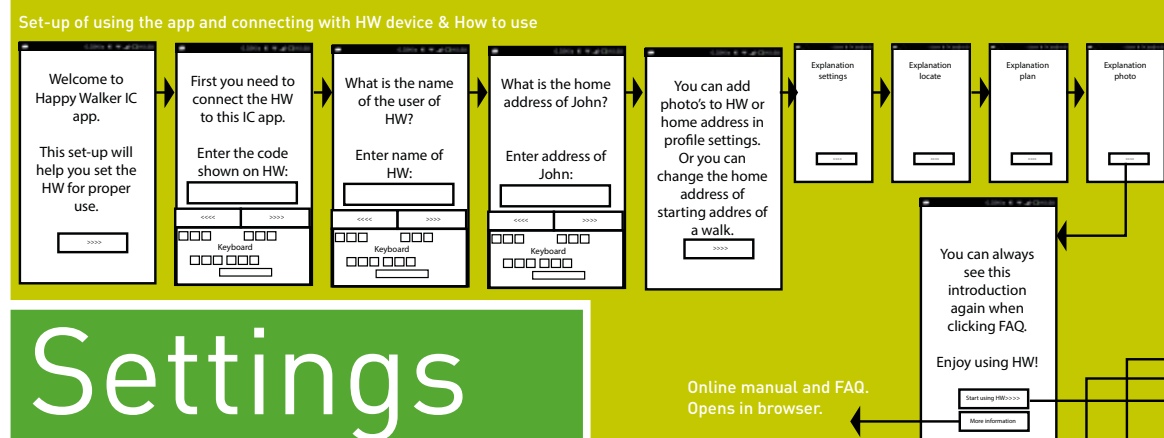
Control the settings of the Happy walker

In this menu, the informal caregiver can connect to a Happy Walker device, set up the flex options and preferences about the messages and notifications that are sent by the Happy Walker system. The informal caregiver can enable accessibility options of the Happy Walker.

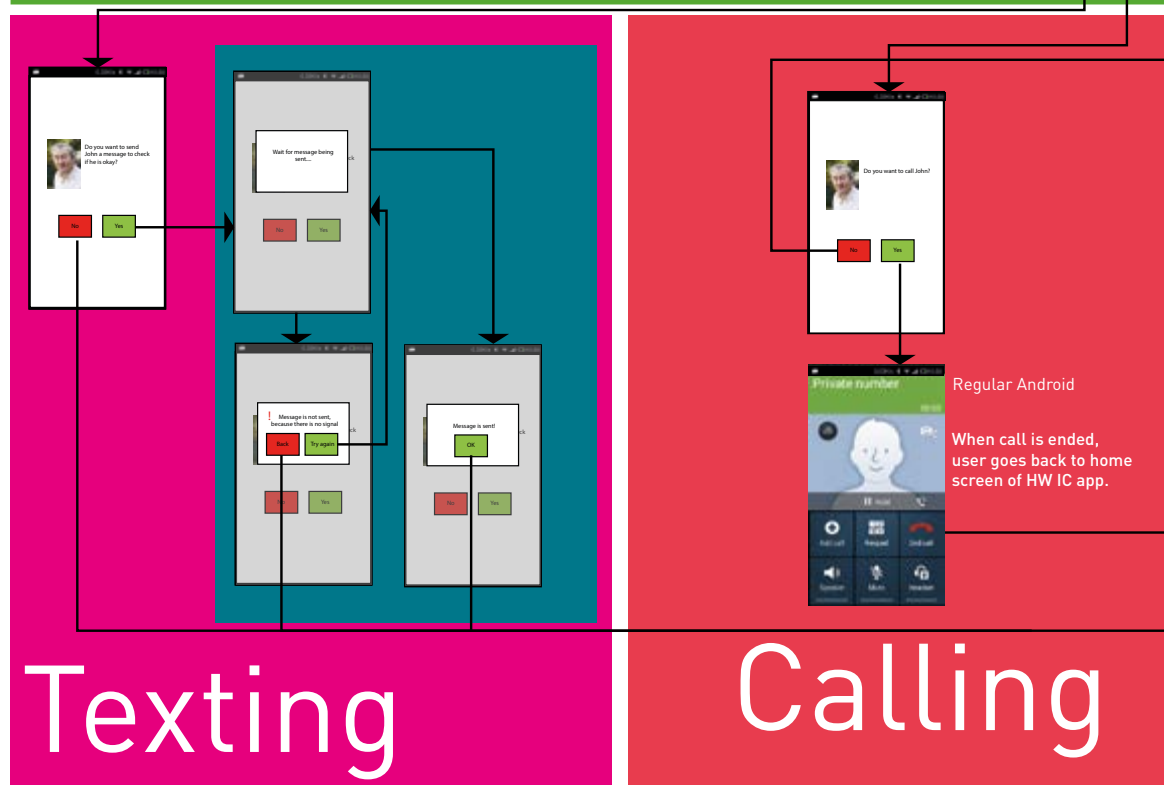
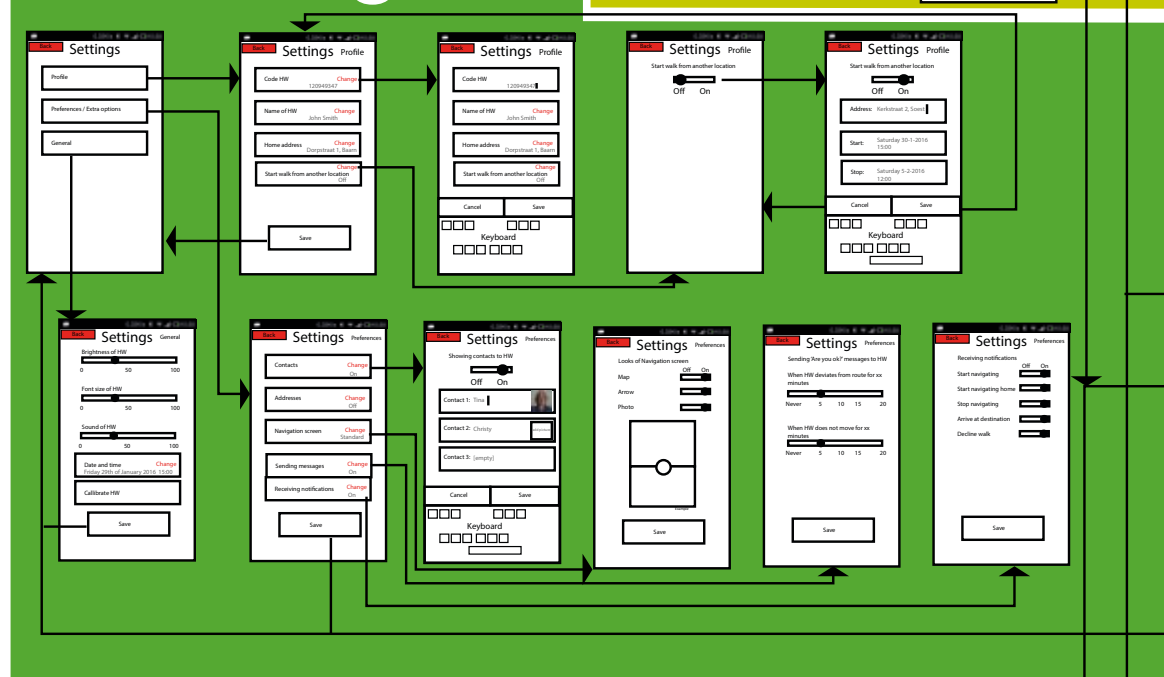
Interaction

The interaction scheme in figure 11 shows an overview of screens and menus that are in the application of the informal caregiver. It shows the complexity of this application compared to the application of the person with dementia. The main screens of all the functions are presented. Some screens in the settings menu are left out of this interaction scheme intentionally in order to keep the scheme concise.

First time use & FAQ



Settings



Texting

Calling

Pop-ups

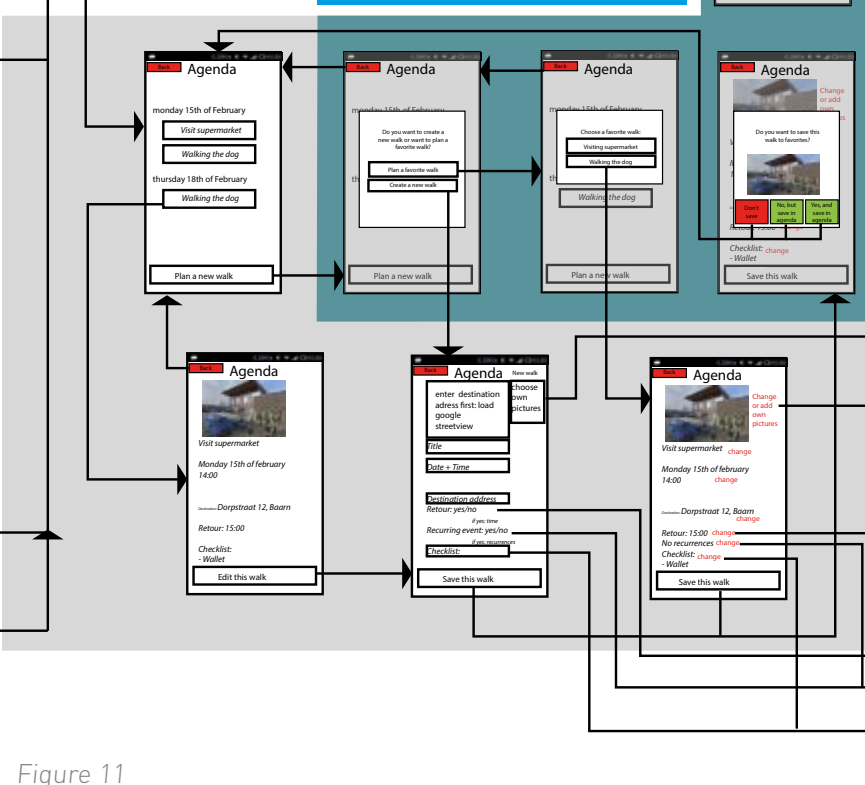
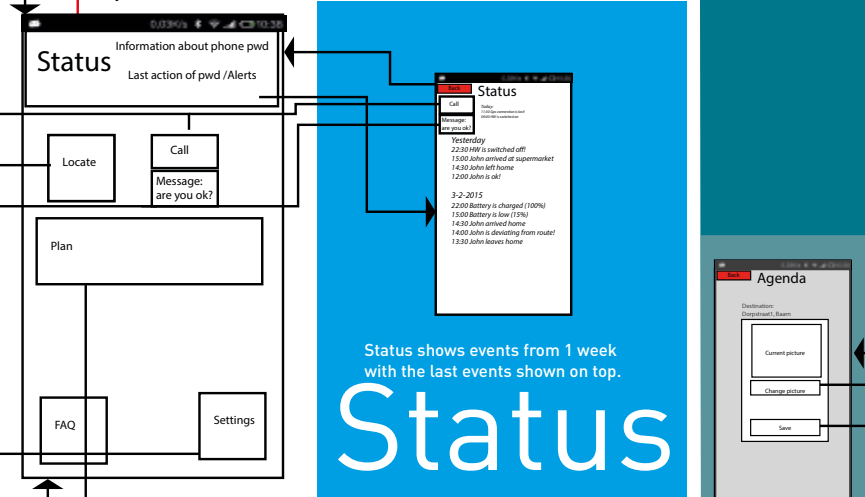
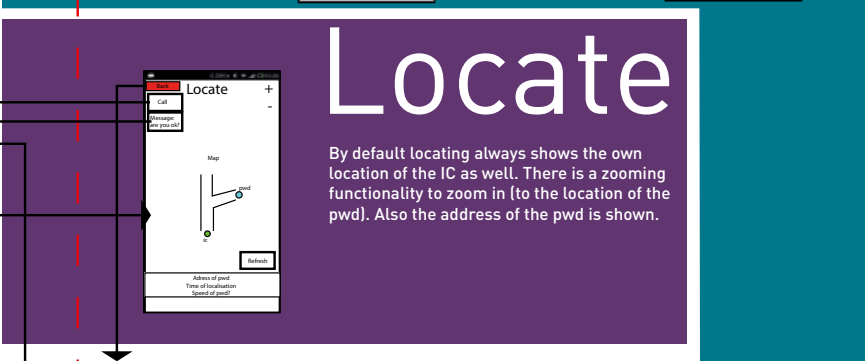
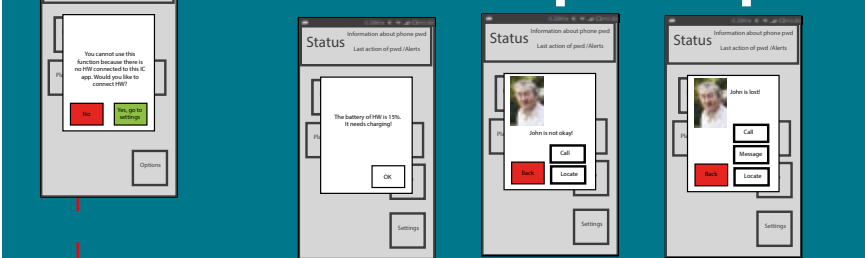
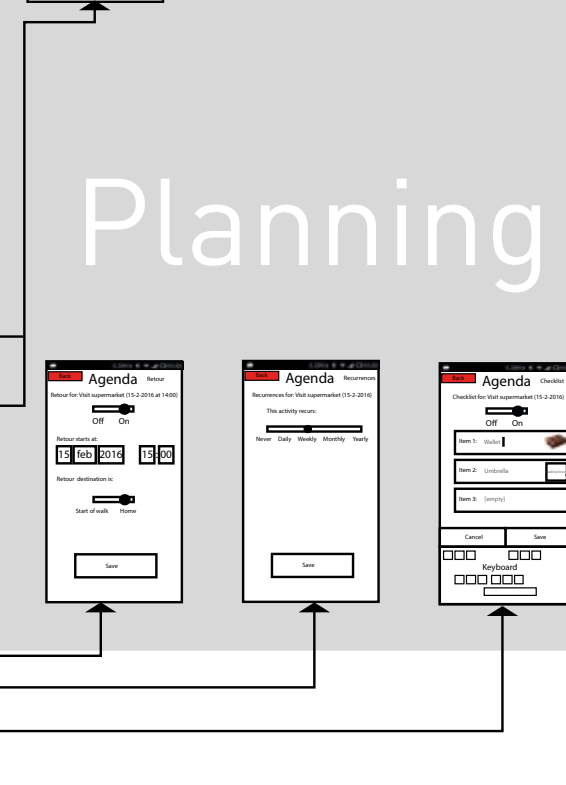
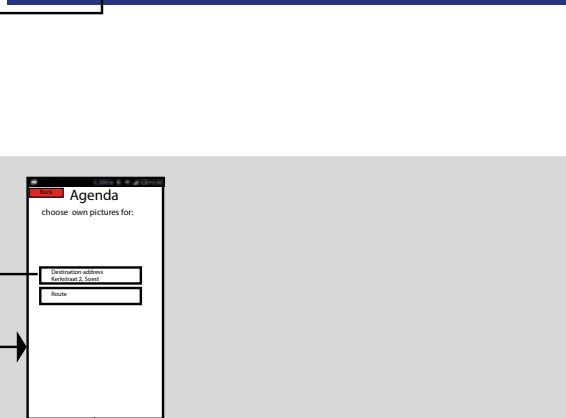
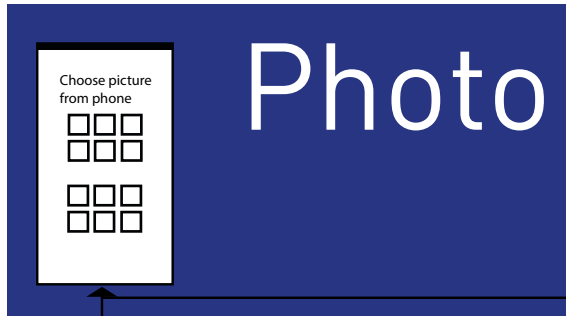


Figure 11



Planning

Design App informal care giver

The design of the informal caregiver app is explained by using the main screens of the application; the main menu, localization function and the function to plan a route for the person with dementia.

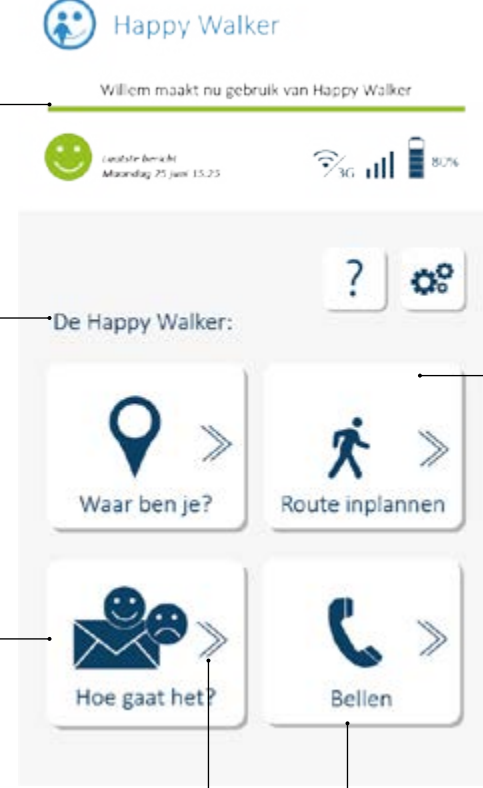
Main menu



Color indicates if the Happy Walker is OK.

The text "The Happy Walker:" helps to understand that the functionalities underneath are functionalities for the Happy Walker.

Both text and icons are used on the button.



The size of the icon for the settings menu is smaller than the other icons since the settings menu is used less frequent. This menu is quite complex and can still be difficult to use for infrequent smartphone users.

Sending navigation route to happy walker



An arrow is placed to make clear that the item is a button with a menu.

The shadow expresses the function of a button.



Pop up should cover the the entire navigation screen

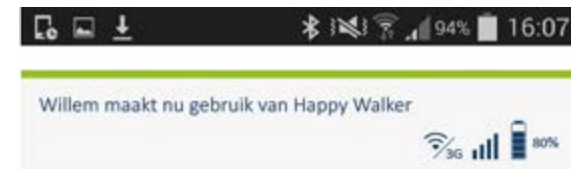
Pop Up

A pop-up is used to communicate the messages that are sent by the Happy Walker. This can be both a message sent by the person with dementia or the system itself. It is advised to cover the entire screen to avoid clutter in the interface or confusion with the status bar.

Figure 12

Flex option and preferences for notification

In the settings menu several flex options are presented and can be switched on/off at all times. Switches are also used to set up the preferences in notifications generated by the Happy Walker system. For example a notification can be sent when the person with dementia did not take the right direction during navigation.

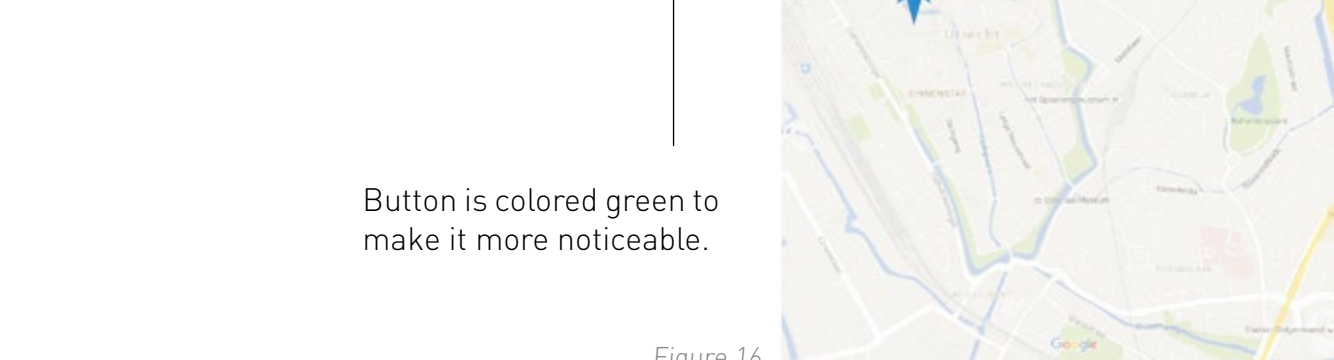


Status of Happy Walker is continuously visible.



Switch buttons are used to control flex options, the green color indicates that the function is on.

Figure 15



Button is colored green to make it more noticeable.

Figure 16

Localization

With the localization functionality the Informal caregiver can find the precise location of the person with dementia on a map. When this function is opened in the app the last known location is presented. The green button can be used to locate again.



Figure 14

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