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## Abbreviations

Abbrev.	Description
AAL	Active & Assisted Living
TP	Test person



## Executive Summary

We made two lab trials, one in Switzerland at 13<sup>th</sup> of December 2016 and one in the Netherlands at 18<sup>th</sup> of January 2017. The findings we got from these two tests are a bit different what is especially because of the diverse experiences TPs had with touch devices. In Switzerland, the TPs learned relatively quickly the interaction with tangibles, problems they had were in particular because of not enough clear processes as taking a photo or record a voice message and send it to a person. The TPs in the Netherlands had problems with most of the tested interaction patterns. They had not any experience with similar interaction patterns so there was no behaviour they could adapt. But also, there was visible, they could learn these new interaction patterns as controlling the device with a tangible.

Out of these lab trials we take the finding that our interaction patterns have to be simpler what lead to the question, how we can do that? The problem wasn't that TPs had to learn something new. More important were the fact that in some of the interaction patterns seniors couldn't go through smoothly. With the interaction of tangibles, we weren't able to display all interactions with just tangibles as interaction elements. Also with the hardware buttons we tested there were some interruptions the seniors had to change from a tangible control to a controlling with hardware buttons.

If we want reach the goal to design easier interaction patterns we have to restrict on just a few interaction patterns that are easily distinguishable. A solution could be tangibles just to use for starting or finishing the provided functions.



# 1 About this Document

## 1.1 Role of the deliverable

This deliverable lists the findings we got out of the lab trials. The findings are an important step in our interaction designing process, especially because we develop completely new interaction patterns in this project. In the finalizing conclusion, we discuss the findings and give some recommendations for further work.

## 1.2 Relationship to other Kith&Kin deliverables

The deliverable is related to the following Kith&Kin deliverables:

Deliv:	Relation
D7.1A-1	Definition of lab trials protocol: this document presents the preparation for these lab trials.
D7.2A-1	Protocol of lab trials: this document presents demographic data's of participants in lab trials and experiences we will have during the execution of the lab trials.
D2.3A	Definition of use cases and scenarios: this document provides the basis for explicit functions/interaction patterns we will test now. Furthermore, it contains first mock-ups of the user interface.
D3.3	Specification of tangible objects, hardware and the user interface: this document presents more details how the tangibles and the user interface has to be designed.
D7.1B	Definition of field trials protocol: this document presents the preparation of the field trials.
D7.2B	Protocol of field trials: this document presents demographic data's of participants in field trials and experiences we will have during the execution of the field trials.
D7.3B	Evaluation report of field trials: this document presents the findings of the field trials.



## 2 Findings lab trials

### 2.1 Trials Switzerland

#### 2.1.1 Findings overall

##### *Chronical history/timeline as start screen*

The idea that a chronical history is a start screen the test persons (TPs) liked very much. It's an easy way to look what is going on. But the timeline on the right side at the screen as it is presented now is too small. It's nearly not obvious, that a line with time points to filter the history are showed.

##### *Presentation of pictures and messages, font size, contrasts etc.*

All TPs explained that the size of pictures, messages and fonts as well are big enough (except the timeline). Two TPs meant that the messages enhancement isn't important during the scrolling process. They would prefer to see all messages in the same size.

TPs that mentioned something about the use of tangibles made positive comments. Font size and thickness were ok for them as well.

#### 2.1.2 Findings in detail

##### 2.1.2.1 Scrolling

###### *Wheel for Scrolling messages in timeline (prototype A)*

At the beginning the wheel wasn't intuitive for scrolling. Especially because of the volume scale that was shown on the prototype. Some TPs hadn't recognized it as a wheel to move (prototype problem). But after a small explanation the TPs did understand and they thought, it's an easy way for scrolling they could learn.

Some TPs mentioned that they would prefer the wheel on the right side. But it's more a question of right or left hander. So, if we want reach most people the wheel has to be right. At the end, it's not only a question of the wheel, the entire handling of the device has to be comfortable. Most crucial is when the device is held in hand. The arrangement of buttons and the wheel is very important and if we will implement such hardware controlling elements, many tests have to be done.

###### *Scrolling with fingers (prototype F)*

Because many TPs had already a smartphone most of them knew basic interaction patterns on mobile devices. That's why they also tried out this behaviour with the testing prototypes. They didn't struggle to interact with fingers and they like them. But one TP meant that she would prefer a wheel for scrolling instead of fingers.

##### 2.1.2.2 Forwarding a photo

Half of TPs had quickly the idea of laying the person tangible on the photo they want to send. The other half needed some instructions of the test leader. They were in an early learning phase but the TPs that didn't expect this interaction behaviour for sending a picture explained that it would be easy to learn and fun to do.



Figure 01: forwarding a photo

### 2.1.2.3 Receiving messages

For all TPs, the shown number for incoming messages was clear (most had already Smartphone experiences so it was not new). The number is shown big enough to perceive. Several TPs mentioned, that they wish to see the person, who sent the message as well.

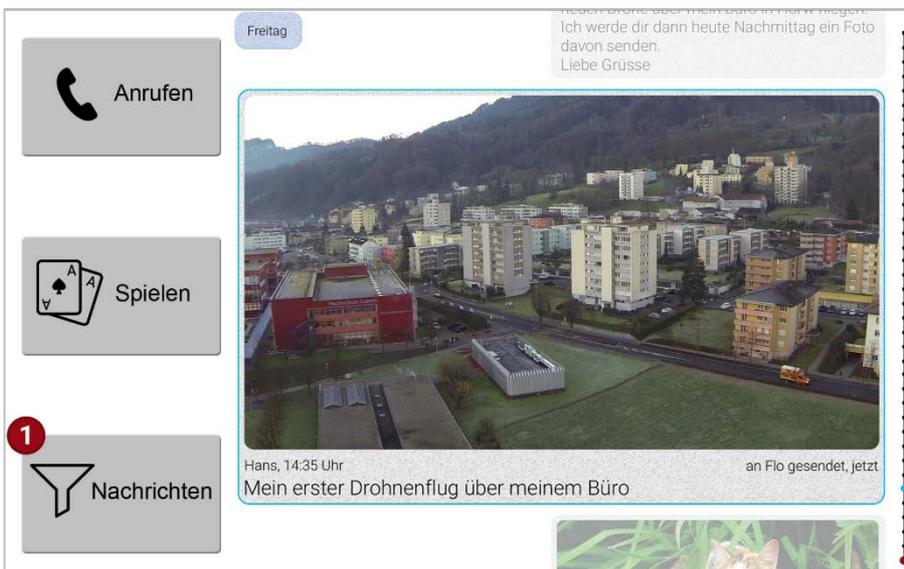


Figure 02: receiving messages

#### Prototype A

For TPs wasn't understandable why they should press "Home" to see the new messages (prototype A). For them reading new messages and got to the home screen are not connected task. Moreover, the main concept of timeline/history up/down as well as to filter messages and photos probably weren't obvious enough in this test. Here we have to work more with headings for a clearer orientation, were they are.



**Figure 03: use of “Home” button**

#### *Prototype F*

To lay the “envelope” tangible on the software buttons “Messages” was easier but not clear for all.

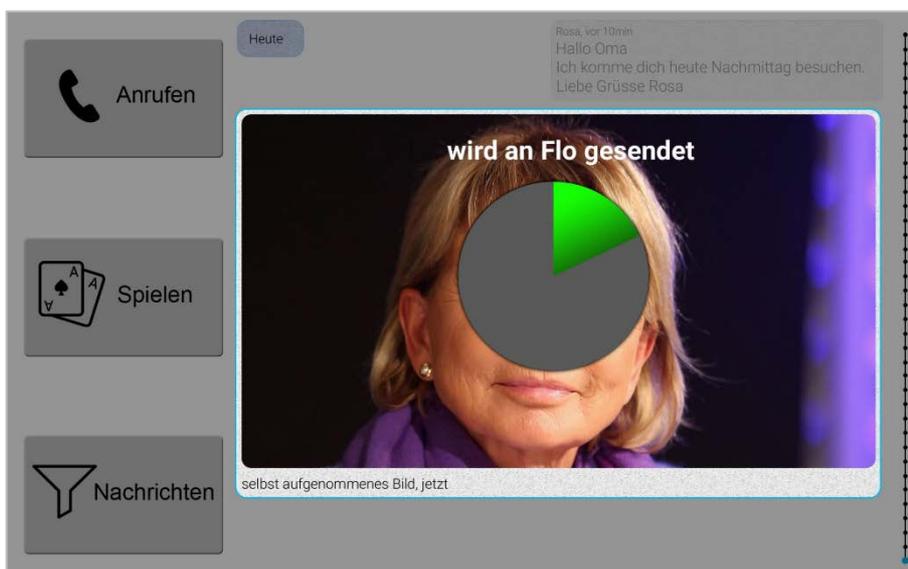
#### 2.1.2.4 Taking a photo and send it to a person



**Figure 04: button for taking a photo and send it to a person**



**Figure 05: recording photo**



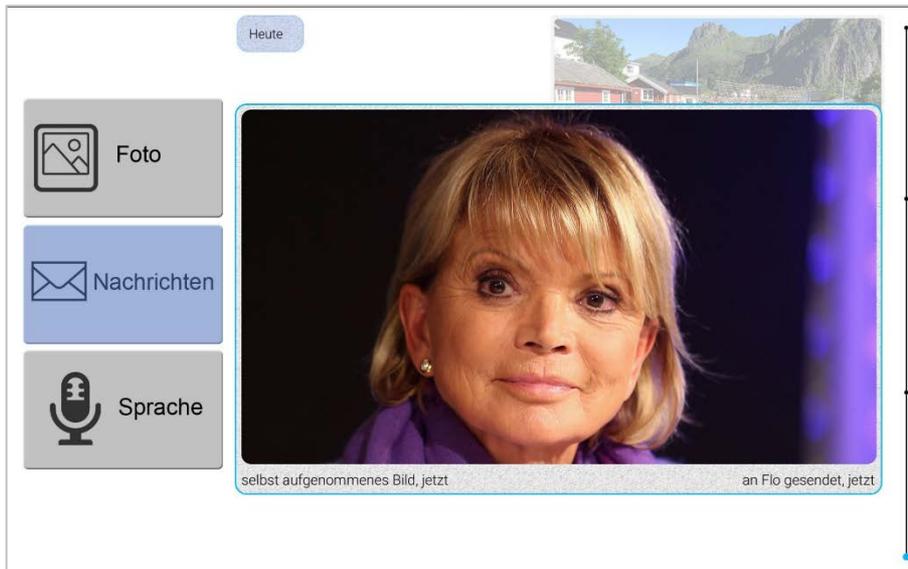
**Figure 06: sending photo**

### *Prototype A*

The task of taking a photo was understandable for the TPs. They had to press the hardware button "record photo". After the photo was shown in the timeline, they had to send the photo to a person (see also task forwarding a photo). The concept of taking a photo with a hardware button they already know from normal cameras, they probably have used. To forward a photo they have learned already in this test a task before. TPs saw no interaction interruption between taking a photo with a hardware button and sending the photo with a tangible, what is very pleasant. The progress display during the recording process they appreciated also very much.

### Prototype F

With this task, TPs had some problems, that we have to differentiate. First, we made a test mistake. TPs had a “camera” tangible, that shouldn’t be shown with the prototype. Because they had learned before a similar process with the “envelope” tangible, they now made the same process with the “camera” tangible, what was wrong. Because of this misunderstanding, many TPs had a bad start with this task.

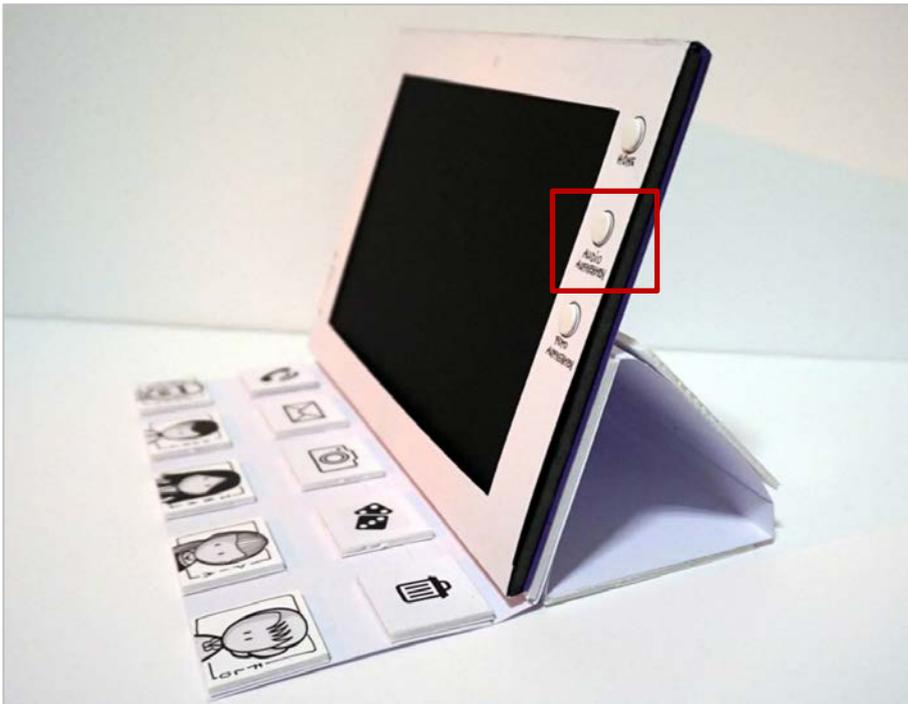


**Figure 07: process after sending a photo to a person**

TPs had to lay down a person tangible on the software button “Messages” and afterwards two new options were shown (photo and voice message). On this screen, TPs had to move the tangible to the option they want to use.

The wording was a topic with this prototype. Only “photo” or “language” isn’t enough. It’s more self-explaining if there the process is described as “sending photo”.

Most problems TPs had with the order of the task taking a photo and sending it. For them is more understandable first to take a photo. After that to send it to a person, instead to go to messages where one option is taking a photo. Moreover, the process was too much automated. After the photo was taken, it was sent directly to a person. A screen where the token photo is shown with a question, if it should be sent, was missing.

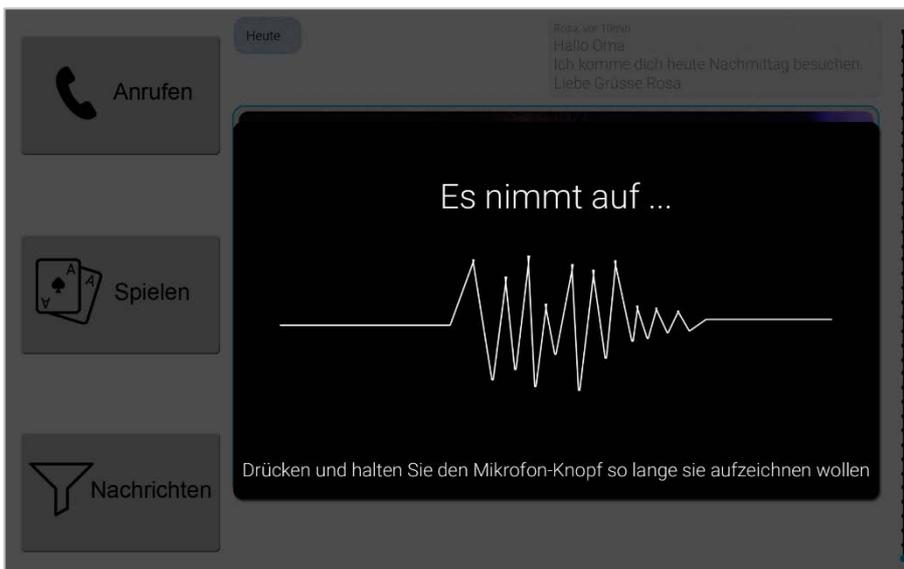


**Figure 08: button for recording a voice message and send it to a person**

### 2.1.2.5 Recording a voice message and send it to a person

#### *Prototype A*

The most TPs had problems to send a voice record to a person. On one side, the wording of the hardware button wasn't that self-explaining. People didn't understand "Record Audio" in the right way. One TP for example explained, audio has something to do for him with music. 3 TP thought they have to lay down a tangible on the software button "Messages" (also TPs, that haven't started with prototype F, because there they have it to do this way). Although all TPs made the same process directly before with the task taking a photo and send it to a person, in this case they had problems and couldn't adapt their behaviour from the previous task.



**Figure 09: voice message is recorded**



**Figure 10: voice message is send**

### Prototype F

Although the TPs mentioned the same points as in the task before, they have learned the process and could do the task very easily. A few of the TPs explained that for them it makes more sense to record a voice record firstly before sending.

#### 2.1.2.6 Filtering messages

TPs could filter the messages in the timeline by laying a person tangible on the software button "Messages". No TPs had any problems with this task and it's important for them, that they can see messages just from one person.



**Figure 11: filtering messages**

### 2.1.2.7 Making a call

No TPs had problems to fulfil this task by laying a person tangible on the software button "Call". 2 TPs made firstly the mistake to take the tangible with the telephone receiver, that mustn't be there (test mistake). The TPs liked the chance to have a video call, some of them already knew Skype. Some of the TPs mentioned that they want to have the chance controlling the volume.

### 2.1.2.8 Playing a game

TPs started intuitively the game by laying a person tangible on the software button "Gaming". Some of them liked the possibility other not. One TP explained, that she would prefer to play a game in real. Another TP added that a video connection would be interesting to see the emotions of the counterpart.

## 2.1.3 Conclusion trials Switzerland

TPs understood and liked the timeline/history as starting point for all functions. Critical point is the presentation of the line on the left side of the screen. The line is too small and difficult to notice. But overall the presentation of other elements is big enough and the font size is easy to read.

### *Prototype A*

TPs had problems to understand the function with the home button, that not only lead back to the home screen. It's also a function to show new received messages (because new messages are always shown on top of the home screen). But the connection of pressing home to see new messages wasn't comprehensible. The process of taking and sending a photo for most TPs was clear. On the other side with record audio TPs had problems. Firstly, the wording "Audio" wasn't clear. Moreover, partly TPs had problems in a first step to record an audio message that is to send in a second step to another person. For some people the other way is more understandable in first choosing an option like messages and then go further with voice message and record them.



### *Prototype F*

All TPs had problems to use the option “Messages” for sending a picture. Because firstly they want to take a picture and afterwards send it. They had the feeling that one step was lacking. The main problem was there that we have no special gallery function and pictures are made mainly to send it. But they have learned fast and in case of sending a voice messages TPs had no bigger difficulties. The question is if sending a photo or sending a voice message are completely different cases. The function “Recording voice messages” is not made for storage like pictures, user just record voice messages for communication.

Out of these tests in Switzerland we cannot have a clear decision what works best, hardware buttons or the interaction with only tangibles. TPs loved hardware buttons but not in any case it makes sense. Moreover, the wheel for scrolling was difficult to judge. If we want to test the wheel a real feeling is needed how it works comparing to scrolling with fingers. What we saw is that commands have to be very clear. Tangibles that show both functions and persons are too complex, especially if additional interaction elements are used for controlling the device.

## 2.2 Trials the Netherlands

### 2.2.1 Findings overall

#### *Chronical history/timeline as start screen*

TPs were completely illiterate. So, they haven't seen a chronical history or something similar before. A few of them used already a desktop computer but if they haven't experiences with Facebook or other systems with such histories, they have no experience. That's why nobody didn't know at the beginning, how to use it respectively understood the underlying system of a chronical history.

#### *Presentation of pictures and messages, font size, contrasts etc.*

Generally, we haven't got much feedback about visual design things. But we could observe that some things were overseen by the TPs. It was only a raw prototype but we have to work on clear visual feedbacks that can be differentiated. That means that we cannot have too many attractions per screen. Especially if we show pictures, steering elements have to clearly distinguish.

### 2.2.2 Findings in detail

#### 2.2.2.1 Scrolling

##### *Wheel for scrolling messages in chronical history/timeline*

No TPs had recognized the wheel as a wheel so we cannot make any conclusion about this. By explaining the function of the wheel for scrolling the TPs mostly understood.

#### 2.2.2.2 Forwarding a picture

The concept of tangibles was very new for them that they didn't understand, what to do first. Many TPs touched intuitively on the screen on the function “Messages”. Although they had no experiences with touch devices they used it in this way. An assumption is that most persons in Europa get in touch in some way with touch devices. They see it in their family, at friends or in the TV. Moreover, the button “Messages” looks like a button what is known of using a computer what some seniors does. That



could be an explanation why TPs touched on the button “Messages”, more than lay a tangible on the screen.

### 2.2.2.3 Receiving a message

Only half of the TPs perceived that on the software button “Messages” on the screen a red bubble with a “1” could be seen. The main driver was the red colour because some TPs mentioned, what is in case of colour blindness? In case of visual impairments many colours could be affected. Therefore, multiple cues as only a colour is needed.

Without explanation, most of the TPs didn’t understand the meaning of this element. Nowadays many web users know the system with the bubbles already but if someone isn’t registered anywhere with an account the person don’t know this element. It’s an interaction element that isn’t very clear the first time because it has to be learned.

To use the home button (prototype A) wasn’t clear for TPs. One TP meant that for her using the function “home” means go back, what actually would be right also in our case. But the test simulation wasn’t that real that TPs could not get this feeling. Moreover, they didn’t realize the schema of the history as a start screen, why they haven’t assessed this step as logical.

To lay the “Envelope” tangible on the screen wasn’t easier (prototype F) because they still struggled with the tangibles at all up to this task. One person explained she couldn’t concentrate on both the screen and at person tangibles at the same time.

But about both solutions some seniors mentioned that if they had it made a few times they got it.

### 2.2.2.4 Record a voice message and send it to a person

In this task, TPs acted very various. For us were it obvious that especially the test setup was hard to learn. They had to concentrate on two new interaction patterns at the same time they never had seen before. That’s why they confused some patterns.

They still struggled with the tangibles but the most puzzling element was the function tangible (prototype F). Many times, they want to do something with this tangible instead with the person tangibles. They have learned the interaction in the tasks before and still want to use them. We guess that the doubled assignment of the icon “envelope” confused.

With prototype A not all TPs perceived the hardware button “record audio”. Not seldom the test leader had to explain. Especially that they had to press down the button a longer time during recording.

We couldn’t get out which process is better understandable between these two prototypes as “record a message” and then “send it” (prototype A) or first pressing “send a message” and then chose the option voice message that afterwards can be directly recorded. In lab trials in the Netherlands problems seems to be more fundamental for TPs. But we have also seen that they need more guidance in the process, more than we saw it in the lab trials in Switzerland. For example, it was not always clear, if the voice messages were sent already.

One TP want to use the function “voice message” in connection with the function “call” what comprehensible as well. It’s very close to calling and they know it already from the function answerphone.



### 2.2.2.5 Filtering messages

TPs had to lay the person tangible on the software button “Messages” what most TPs made right. The one that made it wrong still pressed on the button with a finger.

#### Calling and playing a game

TPs had no problems to start the functions calling and gaming. A few want to start it still by touching the screen. Now in the third or fourth attempt for the TPs they understood the main interaction pattern with tangibles what isn't that bad. We have to consider we mixed some interaction patterns what made it additional complicate to learn it.

To the function gaming many TPs mentioned that this isn't that interesting.

## 2.2.3 Conclusion trials the Netherlands

As in the lab trials in Switzerland we haven't seen a clear favourite between these two prototypes. Most TPs assessed the second prototype they have tested better than the first what is a clear cue for the learning effect.

In this lab trial, we had completely illiterate TPs in relation to using touch devices. But as we have seen they tried very fast to use fingers for interaction what can have various reasons. They could it have seen by other people as family and friends. Then it's nearly impossible in Europa that a person never has seen how somebody uses a touch device. Moreover, we meet nowadays also touch devices in the form of ticket machines, appliances etc. What not means that they are mandatory used to linear hierarchical digital processed while one step follows another.

Nevertheless, many interaction patterns as scrolling and swiping were not known for TPs. Also, features as the bubble with a number for an incoming message, how a chronical history might look like or for sure our new interaction pattern the tangibles.

We have seen that all interaction patterns were new for them what means they had to learn. Also, touch interaction, even if we haven't tested them in pure form, the examples above reveal that many things they don't know.

The prototypes we tested had many weaknesses what came out very clearly with this target group, things must be easier.



### 3 Conclusion / Further Work

With the two prototypes A and F we have made lab trials in Switzerland and the Netherlands. The test findings are different in some ways but not completely. We couldn't find a clear winner of one of these two prototypes but what came out very clearly is the influence of having experience with touch devices. In Switzerland, all TPs had some experience and, in the Netherlands, none of them. We saw that having experiences with touch devices is a big advantage. TPs in Switzerland learned much faster the interaction patterns than the TPs in the Netherlands, although some TPs in the Netherlands already had some experience with the desktop computer. That shows that our interaction patterns are more based on interactions that are used with touch devices.

In Switzerland TPs had especially problems with 1. interruptions in processes at all. What means that with the tangibles or the hardware buttons sometimes we were very restricted. In the design of the entire user interface are with touch interactions more possibilities how to show processes than designing with tangibles or hardware buttons. That's why we made sometimes some changes between different interaction patterns as tangible and touch interactions. These changes weren't that smooth and sometimes not logical. 2. the order of some interaction processes and 3. in processes sometimes we let steps out that users can go through quicker. TPs had then sometimes the feeling of having no control.

In the Netherlands TPs had problems with nearly every interaction. That means that they couldn't adapt any earlier experience they made and had to learn all from the ground. Especially our test setup was probably exhausting for them because they had to learn many different things in a short time what is for seniors a huge challenge. But we saw also there a learning curve.

We clearly saw in the lab trials in the Netherlands that all interactions were new for them, also touch interaction. But we noticed that many of them, although they had no experiences with touch devices, very fast tried to touch on the screen. Explaining reasons can be that they have seen from other people how they touch on devices. Also imaginable is that touch interaction is direct. No aid as mouse or in our case tangible is needed. Users can press on that they need. This is in direct concurrence to our tangibles. We have seen that people very fast adapt their experience and can use them. Without any experience, it needs a bit longer. But in fact, the complexity is a bit higher. The tangible is a kind of tool people have to learn. The tool has a special function, not only to use it to start an event/function, moreover the tangible even says with which person the event should start. If we now have not only person but also function tangibles the complexity is too high, we should only use person tangibles. With hardware buttons, we saw that many seniors liked them because they know hardware buttons already. But in fact the application of the hardware buttons in relation with the user interface is new. Moreover, also here we have an increased complexity because of the use of different interactions patterns with hardware buttons and tangible that are mixed. Both of them are indirect interactions that the user controls on another place the devices than reactions of the controlling are showed.

Many discrepancies in our interaction patterns arose due to the short interaction designing phase before these lab trials. We had more barriers to overcome than we had anticipated. That's why the findings aren't all that meaningful. But we have to lay down that it's important that we don't derive the wrong findings out of the lab trials. We saw that especially seniors with no experience in using touch devices had the most problems



with our devices. But this mean not automatically that all of our interaction patterns are too complex and we should concentrate only on an interaction pattern with touch control. We haven't tested a device with only touch control. But we have seen that interactions that are inspired by touch controlling or also are typical for touch devices TPs had problems as well.

In designing interactive systems it's always a question of which use cases the users should deal with. Use cases should be inspired by the requirements of the users. But this is sometimes a mismatch than the more functions with a system are possible the more complex a system will be. Moreover, some use cases are easy in designing an adequate process and some use cases are very difficult. To enable seniors to make a call is on a user interface level not that difficult. But enable users to communicate with short messages, taking and sending pictures and eventually also the storage of pictures is much more difficult. So, to design an easy user interface means too to reduce in complexity what leads to a reduction of possible functions. In the deliverable 2.3 we had listed use cases we want to enable. We had already reduced the requirements out of the end-user analysis we made because we saw that we cannot all requirements provide in our device. And in these lab trials some users meant as well they want to have extended possibilities as reading newspapers, booking flights or doing e-banking. But this is the mismatch. Some of the seniors these wishes explained were very inexperienced and could do this with only a huge effort. Additionally, in designing our user interface we came to limitations as we couldn't design all intended use cases for a simple usable device because we already reduced.

One thing more is to mention. To design an interaction that everybody will understand is not possible with this complexity we want to show. TPs explained for example they need manuals. We can assume they need support from people that show them how to use our device as well. But the point when seniors will start their use of the device is also very important. In the test the TPs were in the middle of many information. Normally, with such a device they start with just a few information that can be learned more easily and go then further step by step. We could support this process with a wizard that explains the first steps very slowly and guide new users through the most common processes.

We now have discussed many different points we should look at in further designing of the user interface but can sum up two main findings out of these lab trials that are: 1. our interaction patterns must become simpler 2. we have to restrict our complexity that comes out of functions we want to provide the seniors. With the second point, we are on track because we had already reduced use cases that were defined in deliverable 2.3. In the first point, we have to dig a bit deeper to evaluate what exactly simplicity means and how we can reach them. Following some principles, we have to look at:

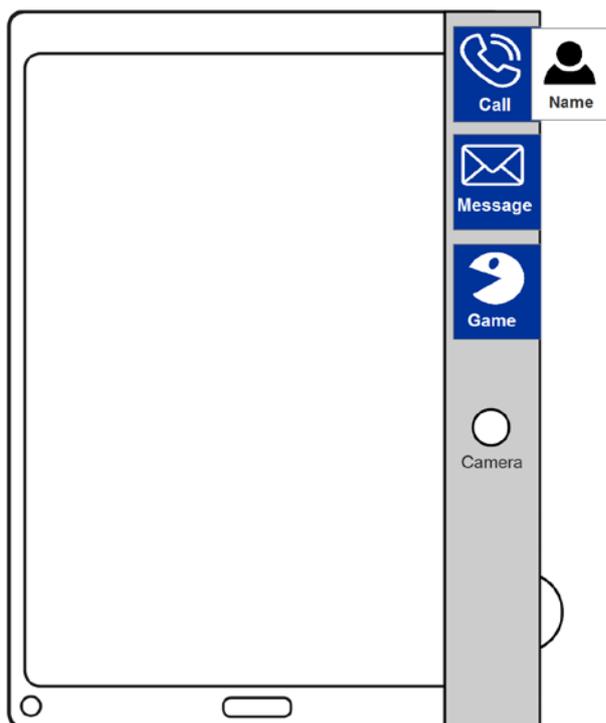
- Only person tangibles, the function tangibles are in direct competition with the functions we show as software buttons on the screen
- We have seen that hardware buttons (prototype A) and tangibles together increases the complexity. We can use only one of these elements or we use the hardware buttons only for very special events like taking a photo
- For the wheel, we cannot make a reliable statement. Many TPs liked the idea but for more information value users have to feel the interaction and then assess
- In prototype F events were controlled by laying a tangible on the screen or also move the tangible on the screen. We cannot say that an interaction only by

touch is easier. But we have seen that we were not able to display a smooth interaction only with tangibles. We had also to use touch interactions that leads to bad interruptions in the interaction process. Changes of interaction patterns aren't comprehensible

The principles suggest that we have to:

- 1) decide, if we make a device with tangibles or with hardware buttons. The wheel could be probably a standalone feature
- 2) we haven't found ways to use tangibles in an extended form as controlling element. Perhaps we have to go back a step and use them only as starting element of interactions. Further interactions than could be made by touch. Actually, we explained we want to have no interruption between interaction patterns but in this special case it's possible to clearly differentiate between a tangible interaction to start a function and all further interactions/settings that are made by touch interaction. This interaction than could be made also on the frame of the devices and hasn't to be mandatory on the screen.

In figure 12 is a mock-up presented that shows a new idea of a practicable way for Kith&Kin. The mock-up is rather similar with the idea we already had to the beginning of the project. Maybe we had to identify in the first steps which possibilities we have to recognize what can work for users and what not.



**Figure 12: tangibles only to start functions (on the border)**

In our lab trials, we saw clearly there is no intuitive behaviour for all our interaction patterns. There is no relation to real life as we assumed before. But the tangibles should also give some fun in interacting with a device what is especially for seniors important that are afraid to learn new things. For many touch interaction is a huge barrier because to control something by touching on the screen seems strange to them. Maybe we



should concentrate more on this criterion of how seniors could overcome their barrier of learning a new strange thing.



## Appendix A

### A.1 Findings lab trial Switzerland per test person (December 13)

#### Testing person TP CH-01 (female)

Beginning with model A (with hard buttons and wheel), then testing model F

First impression is very good, the device is nice, it motivates to play around and to occupy with it.

On the graph for the timeline one should see a scala or chronological division so that one knows where to search for a certain message.

The idea of tangibles is good and motivating.

- A1) Nobody can guess that by scrolling the wheel earlier messages will be shown – this has to be explained. If you know how it works, it's an obvious choice to scroll the Biallas-wheel to shift the pictures on the display.  
Would be better if the wheel were on the right side for right-handers. It's not only non-disturbing if the wheel is on the same side as the hard buttons, it's a progress.
- A2) TP spontaneously takes tangible with photograph of "Flo" and puts it on "Nachrichten"-button. After being shown how she can send photographs, she thinks it's supergood if you know how it works. Yes, it's easy to learn and transparent. The symbols that show progress of sending and when the photograph has been sent are very clear.
- A3) It's very easy to understand that the number shows a new message has been sent. The surplus information who sent this new message would be nice to have, but is not absolutely necessary. After being given the information to push the "home"-button to see the latest message she finds this understandable and intuitive.
- A4) TP intuitively pressed button "Fotoaufnehmen", laughed when Uschi Glas appeared, then intuitively laid down the tangible of person "Flo" on the selfie. She explained that for her it's a normal procedure to press the hard button first and then lay the tangible on the display. Those were two different processes that were put in in two different ways. The process of taking a picture is clear. The countdown gives safety.
- A5) Sending a voice message was not that clear for her. The chronological order was a problem for her: First she laid the tangible on "Nachricht"-button, then pushed the



button "Audio aufnehmen". The wording should be changed, "Sprachnachricht" would make things clearer.

- A6) Filter items in timeline was easy for TP, intuitively she laid the tangible "Flo" on button "Nachrichten". She needed no help. Her remark: On the timeline, there should be shown a scala or division to give an idea how old a message is.
- F1) TP intuitively scrolled with her finger down the homepage to search for an older message. Her first impression was good. The size of letters and pictures is ok. Everything is alright. She uses a smartphone sometimes and therefore knows how to scroll. For her, the timeline (if bigger) can be perfect.
- F3) Tangibles with function-symbols are not self-explaining. Test leader has to explain that they have to be laid on the display. After this general explanation, TP intuitively laid tangible "Briefumschlag" on menu button "Nachrichten". The display of a new message is well understandable. For TP model F isn't "better" but still easier to understand.
- F4) In model F the chronological order of taking a selfie and sending it to "Flo" is very much in need of an explanation, it's not intuitive for TP. After explanation, the appearing menu buttons are clear. TP is more used to hard buttons. The size of the messages is "tiptop"
- F5) The procedure for sending a voice message is very similar to sending a selfie. TP has no difficulties. First she tipped with her finger on the optional button "Sprache", then put the tangible on it. It's not self-explaining but easy when understood.
- 7) Calling "Flo" isn't difficult for TP. Intuitively she lays the tangible of "Flo" on the button "Anrufen". When telephone call starts, she says "good that it starts at once". TP finds video call great, good to see oneself, the procedure is quite easy. TP finds it understandable to sit still on her place while the video is taken: If I made a call with my old landline telephone, I have to sit too and the device remains on its place. To get good pictures, both mustn't move.
- 8) TP intuitively laid tangible "Flo" on menu button "Spielen". In "Mühle" we were good, I very much like to play "Mühle", she says.

Free comment:

For TP CH-01 five tangibles for persons were enough. People with big families will need more.

"Next Christmas I want to get this device as a present! Everything well thought, build it, its perfect."

## Testing person TP CH-02 (female)

Beginning with model F, then testing model A (with hard buttons and wheel)



TP CH-02 is most experienced and had little time, therefore a shorter Test. She was the only one who watched the test of another testing person (her mother, TP CH-01). However, her test was not immediately afterwards but 6 hours later. TP CH2 does not own a tablet and doesn't use one regularly.

First impression of the mockup: Very interesting concerning positioning and size.

- F1) TP fulfills task without problems. The timeline is clever, she thinks. Interesting question: Where's the keyboard? If You don't read a message but want to send one, how can You write with this device? Even if You want to write a note accompanying a picture – how can You find the letters?
- F2) "On the tangible with photographs of persons I see the person behind the picture, not a symbol. There is no danger of feeling kidded by using tangibles." TP has no problems to send the picture to "Flo" by laying the tangible of "Flo" on the picture "Mein ersterDrohnenflug...".
- F3) TP knows that new messages were shown by a number in a red circular area. She suggests that additionally an acoustic signal could be used. Putting the tangible with the symbol of an envelope on the menu button "Nachrichten" is not a difficult task for TP.
- F4) TP lays person tangible "Flo" on the menu button "Nachrichten". When the menu button "send photo" is shown, intuitively TP lays tangible with symbol of camera on it. Test leader has to explain that tangible "Flo" has to be moved from "Nachrichten" to "foto" and the tangible with the symbol of a camera is not needed here. The menu buttons "foto" and "sprache" are not self-explanatory. If



it's done once, it's easy to understand and to learn. The process of taking a picture is seen by TP as one separated step before sending this same picture to "Flo". The messages and the picture are big enough for TP.

- F5) TP needs a little help to send voice message to "Flo": She doesn't move tangible of "Flo" intuitively to "Nachrichten" and "Sprache". Although this process is perfectly analogue to sending a photo, it's not intuitive or self-explaining. (Conclusion of test leader).
- F6) Again, for the task showing exclusively the messages from "Flo", TP needs a little help. After a hint of test leader, she lays down tangible of "Flo" on menu button "Nachrichten". This method of filtering seems to be very easy to understand.
- F7) Putting the tangible of "Flo" on menu button "Anrufen" to start a video call seems very easy and very good to TP. She likes seeing the video of someone from family or friends to see how the person is looking while telling he or she is fine.
- F8) TP likes the idea of playing a game with a relative or friend. Her question: Does the counterpart need a special Kith & Kin-device, too, or can the system/software be downloaded on ordinary tablets or notebooks?

## Testing Person **TP CH-03 (male)**

Beginning with model F, then testing model A



First impression: Scrolling without tangible is not intuitive.

- F1) The size of pictures and fonts in messages is good, mustn't be too small. The message that is focussed is clear. Explanation is needed for TP to realize how to scroll on the timeline. Afterwards its perfectly clear. TP is used to scrolling with his finger on his smartphone. TP likes the idea of the timeline on the starting screen. It has to be much bigger and it should have some division so that the space of time can be seen (hours ago, days, years...)
- F2) TP doesn't lay the tangible of "Flo" on the picture, but instead the tangible with the symbol of the camera. The whole process had to be explained. After some explanations of test leader everything is clear and good. Remark of TP: If you know how it is meant to work, it's a great facilitation compared to regular smartphones.
- F3) I can see the number "1", from my smartphone I know that this means I have a new message, says TP on first view. Intuitively TP lays tangible with "Briefumschlag" on menu button "Nachrichten". Test leader asks for an alternative, intuitively TP scrolls up on the timeline. He says that this procedure is very easy to understand. The additional hint "message from Flo" would be an additional facilitation, one could delete adverts at once.
- F4) TP knows how to take a selfie. The process with model F is far from being self-evident or self-explaining: TP began with the tangible with the symbol of a camera. Test leader has to explain step by step where to put which tangible. After having

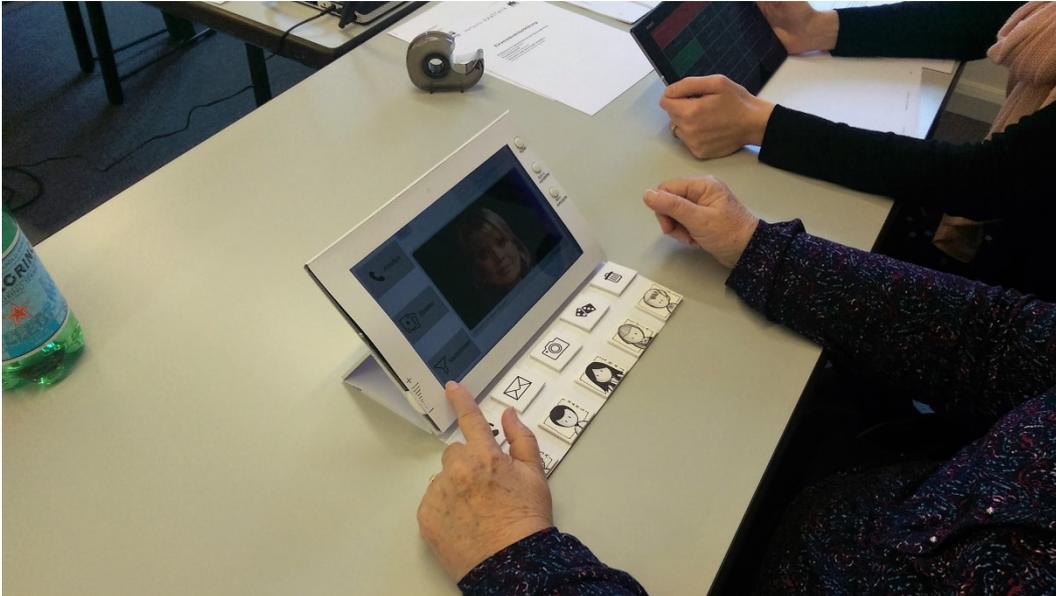


gone through the process once, TP finds it very easy to learn. The appearing menu buttons "Foto" and "Sprache" are "logical"

- F5) for TP. The process is easy, the problem is to learn the progression. Intuitively one would precede the procedure "take a selfie" and then continue with the second step "sending selfie to Flo". "Take a selfie" is another procedure than "sending something to Flo".
- F6) Sending a voice mail is much the same procedure like sending a selfie (or any photo). Because of the likeness, the procedure was perfectly clear for TP. But in this case, too: TP normally would take a voice record first, and then he would send it as a voice message to somebody.
- F7) Showing only messages that are linked to Flo is perfectly intuitive for TP: His proceeding intuitively corresponds to what the developer had in mind. The filter-task is an easy one for TP.
- A1) Scrolling with the Biallas-wheel isn't intuitive for TP without explanation from test leader. TP begins with laying the tangible "Nachricht (envelope-symbol)" on menu button "Nachricht". As soon as he understood that the Biallas-wheel works like a mouse, he used it in the right way. He would prefer the wheel being positioned on the right side (he's right-handed).
- A3) The new message being shown by the number "1" on the screen is intuitive for TP. Pushing the button "home" to see a new message isn't intuitive at all for him. Explanation of test leader is needed.
- A4) Sending a photograph by pressing the button "Fotoaufnehmen" and afterwards putting the tangible "Flo" on the picture that symbolizes the selfie is very intuitive for TP. He finds this procedure much better, more intuitive than with model F. To press the button with the corresponding inscription is self-explaining. The countdown is ok. The process in model A is very much easier to understand for the TP. (He gives AAA!)
- A5) The hardware micro button "Audio aufnehmen" is not intuitive for TP. He connotes "Audio" exclusively with music. After some explanations of test leader he finds the procedure "comprehensible". If the inscription on the button were named "Sprachaufnahme" e.g., the analogy to "Fotoaufnehmen" would make things much easier.
- A7) To call "Flo", TP first wanted to activate phone by putting the tangible with the symbol of a phone on menu button "Anrufen". As soon as test leader said "No, stop" TP lays tangible of "Flo" on menu button "Anrufen". Video and telephone call together are not totally new for TP, has seen skype calls and sees similarities.
- A8) TP spontaneously and intuitively lays tangible of "Flo" on menu button "Spielen" and is ready to start gaming with "Flo". He likes the option to play a game with someone else on the communication device.

## Testing Person **TP CH-04 (female)**

Beginning with model A, then testing model F



- A1) Searching older messages by scrolling the Biallas-wheel is not intuitive for TP. First she touches the menu button "Nachrichten" with her finger. Once she knows that she can "move on the timeline" by scrolling the Biallas-wheel, this is obvious to her and easy to learn. TP preferred the wheel on the right side, because she is right-handed. For her it would be perfectly ok if hard buttons and wheel were on the same side.
- A2) Intuitively TP lays tangible of "Flo" on the picture to send it to him. This procedure she finds good. No need for the test leader to help. TP finds it easy and a good thing. The green circular area she thinks is very positive, because one can see it works. The tangibles have a good size, they were easy to grab.
- A3) TP understands at once she has a new message when the red circular area with the number 1 inside is shown. It's easy to read for her, the size is good. If additionally, the information was given who sent the message actually, she would be glad. To press the "home" button to read the incoming message doesn't seem plausible to her. On other devices "home" leads back to main menu, TP says. Message and pictures are big enough for her.
- A4) After a short irritation, due to not having read all the inscriptions on the buttons, TP presses button "Fotoaufnehmen". Afterwards she puts tangible of "Flo" on the picture (as she is used to from task 1). TP comments the procedure "quick and painless". TP doesn't see the two processes – pressing the button to take the selfie and laying the tangible on the display to send the picture-message – as a systemic interruption. Both steps were perfectly clear.
- A5) Sending a voice message is easy to understand and easy to learn for TP.



- A6) To filter messages from one person, TP intuitively lays tangible of "Flo" on menu button "Nachrichten". She thinks it's a good thing to see messages only from one person. She knows the function from facebook.
- F1) Instead of scrolling with fingers, TP lays function-tangible with the symbol of an envelope on menu button "Nachrichten". After a hint of the test leader, TP finds it very clear to scroll with her fingers on the timeline. The messages and the pictures have the right size, they were well presented. She would prefer an overview of messages without one being exclusively focussed. TP is more familiar with scrolling with a mouse than scrolling with her fingers.
- F3) Task 3 was quite easy for TP. Intuitively she placed the tangible with the symbol of the envelope on menu button "Nachrichten". This was obvious for her. TP finds it easy to understand how it's signalized that there's a new message.
- F4) Instead of laying the person tangible "Flo" on the menu button "Nachrichten", TP lays symbol camera on the button "Nachrichten". TP finds version A much more intuitive, much better understandable than this version F. After instructions from test leader, TP manages to send "Flo" a photograph of herself.
- F5) Task 5 is easy for TP: "If You've practised it twice, you know how to manage it, it's not that difficult.
- F7) TP fulfills task without any problem. She mentions that Skype is very good if people live in far distance from each other. Regulation of volume is important if someone can't hear well: Her husband is concerned, she herself isn't.
- F8) TP doesn't like online gaming that much. She prefers life gaming if at all. She didn't play "Mühle" for a quite long time. Playing cards or dice was more important.



## Testing Person **TP CH-05 (male)**

Beginning with model F, then testing model A

- F1) TP intuitively touches the screen on the menu button “Nachrichten” to search for older messages. After a short instruction by test leader, he wipes on the timeline. He complains that the line for scrolling with a finger is much too small, too lean. Picture and font have good sizes. He would like the timeline to be proportional to the messages. TP is familiar to scrolling by wiping from a smartphone.
- F2) Instead of laying tangible of “Flo” on the picture, TP first touches the tangible, then picture and at last the menu button “Nachrichten”. He needs to be pushed to put the tangible “Flo” on picture “Mein ersterDrohnenflug...”. Then he asks, why the tangibles aren’t buttons in the lower row of the display – the sense of tangible objects on the first sight is unclear for him. After the explanation of the correct process by test leader he resumes: “This may be a facilitation for people who are not used to technical devices. Yes, the progress indicator is a good thing, one knows when the process is progressing. Concerning tangibles, TP fears they might be lost.
- F3) TP at once understands that there’s a new message when the red circle area with the number one in it is shown. Intuitively he lays function tangible “envelope” on the menu button “Nachrichten”. He finds the display of a new message very easy to understand. Additional information about who sent the message would be nice, TP says, but not necessary for living. The process is understandable and intuitive.
- F4) TP lays function tangible of camera on the menu button “Nachrichten” to take a selfie. Test leader has to explain step by step the procedure of taking a selfie and sending it to “Flo”. TP finds order unlogical and inconvenient. The menu buttons “Foto” and “Sprache” (language) do seem clear to him. The countdown is a good thing. Size of messages and pictures is perfect for him, maybe a bit small for others. The order of taking a selfie or a voice message and sending it to “Flo” seems to him “like visiting someone to see if he’s at home and then go to the bakery to buy the bread I wanted to bring to him from the beginning”.
- F5) Because of the analogy with the selfie, TP intuitively takes the right steps to send a voice message to “Flo”. Interesting remark in the end: “One should be able to retrieve one’s voice message before sending it. The same with the photo: here lacks a step inbetween.
- F6) Filtering messages from one person seems easy to TP. He needed no help at all from test leader. Maybe it’s a good thing, he considers – but the timeline should filter the messages chronologically, i.e. in the way of a calendar.



- A1) TP guesses that Biallas-wheel is for volume. Therefore, he tries to scroll the messages on the timeline using his finger. For him, the mockup isn't totally intuitive. He likes the wheel on the left side, but he would prefer if it were higher up. Wheel and hard buttons being separately from each other is preferred by TP. The timeline as the starting screen is a good idea, he thinks. Concerning scrolling he thinks that everybody is used to scroll with one finger...
- A2) Task was missed out accidentally.
- A3) The way how it is shown that one has received a message is understandable to TP. He would like if he could just tipp his finger on the button "new message" and thus invoke this new message. The name "home" for the hard button that one has to press to see the new message in the eyes of TP is "rubbish". Nevertheless, the hard button himself is a better solution than with model F. After having pressed the hard button there should be seen the indication "message from Flo".
- A4) To send a photo of himself to Flo seems very intuitive to TP. No help at all is needed for him to get from step to step. Once he has seen that it's not the menu button "Nachrichten" on which he has to lay tangible "Flo", he finishes the task fluently. This second version seems much more intuitive to him. First taking the photo and afterwards sending it to somebody (one chose)... Another good thing is, that one can control the quality of the photo before sending it.
- A5) Sending a voice mail to "Flo" was not likewise intuitive to TP. "Audio aufnehmen" was the third hard button he pressed. Instead he first laid tangible "Flo" on menu button "Nachrichten". "Sprachnachricht aufnehmen" would be the better choice than "Audio" (conclusion of test leader). With this change of name model A sending a voice message for shure will be better understandable, more intuitive.
- A7) With his second try TP lays tangible of "Flo" on menu button "Anrufen". TP is indifferent concerning video calls. He wants to have at least the possibility to change volume.
- A8) Starting a game with "Flo" is totally intuitive for TP. He'd prefer to play "Mühle" life. He does like the game very much. If he had to play this game on a distance, it would be nice if not only photos were shown but videos to see the reactions of the other player...

## Testing Person TP CH-06 (female)

Beginning with model A, then testing model F



TP has very little, nearly no experience with electronic communication devices.

- A1) Wheel reminds TP of an instrument to adjust volume. Test leader explains task and use of wheel. The idea of scrolling by turning the wheel seems good to TP once she has understood. She thinks one can easily learn the use, but doesn't think it's intuitive. The wheel on the left side is preferred.
- A2) First try of TP to send a photo is by tipping with the finger on the menu button "Nachrichten". After short explanation of test leader, she can fulfil the task. But she would like to send a comment together with the picture. How to write on the K&K-device? (Can we still follow the idea to scribble with a special pen directly on the display? Can we send handwritten messages?) For TP, the idea of tangibles doesn't seem self-explaining. But once it's understood, it's a good idea.
- A3) The number 1 in the red circular area is very striking and easy to understand. Brightness, font and size of messages are very comfortable. NO! The "home"-button isn't intuitive at all. It needs a better name.
- A4) TP searches a menu- or hard-button to take the selfie. Needs a little time to find "Foto aufnehmen". Afterwards she calls the process clear. The countdown is good and understandable in her opinion.
- A5) TP tried to place the tangible with the function button "envelope" somewhere on the display to send a voice message to "Flo". After a hint from the test leader she searches a hard button and uses it. The expression "Audio aufnehmen" isn't self-explaining to her.  
The rest of the procedure is self-explaining to her and quickly performed.
- A6) TP is quite helpless when searching for the way to filter Flo's messages. An explanation is needed until she lays tangible of "Flo" on the menu button "Nachrichten". Now she doubts the concept of tangibles in general: She thinks it's



dangerous inasmuch as old people might understand it as being kidded.  
(Comment of test leader: In her working life TP cared for older people every day. However, she sees only the deficits in older life).

- F1) TP scrolls with her finger on timeline at first try. She thinks nevertheless that this is contradictory to the concept of tangibles. The size of pictures and fonts is ok with her. She thinks that all messages should have the same size, none should be focussed before being selected. TP says that she knows scrolling with a finger from the iPhone. The idea of a timeline as starting screen doesn't bother ("stört nicht" isn't very positive). She prefers the Biallas wheel instead of scrolling with the finger.
- F3) The way how it is shown that there's a new message is easy to understand for her. At the second try she put the function tangible "envelope" on menu button "Nachrichten".
- F4) To send a selfie to "Flo", TP first wants to take a photo and fails. Her general summary at this task after having been told by test leader step by step how to send a selfie: Nothing is intuitive here, why do I have to push the tangible "Flo" to menu button "Foto"? No step is clear for her. The countdown is helpful. The photo being sent immediately after choosing the menu button "Foto" is a strange idea for her.
- F5) To send a voice message is much easier now: TP repeats the steps from task 4 but instead of "Foto" she chooses "Sprache". Voice record is intuitive for her. The change from laying tangibles to tipping a menu button puzzles her (stop recording), but she is able to fulfil the task.
- F7) Calling "Flo" is perfectly intuitive for her. Each step is done on her own. She would like very much to phone relatives that way (videophony). Yes, she wants to regulate the volume.
- F8) TP doesn't play games at all. She doesn't like "Mühle". TP can't imagine to play games on a distance with the help of a communication device.



## First findings of Julia Nuss and Thomas Meyer before starting the test of the prototypes

- The idea of a “wheel” for scrolling is generally very good
- The wheel on the mockup doesn’t move, this doesn’t motivate to continue scrolling, the technical deficiency hinders TPs from using the device in the intended way
- Why should it be intuitive to scroll the Biallas-wheel to find earlier news – this information has to be given
- It’s more intuitive and therefore more probable that TPs will tipp on the menu button “Nachrichten” to get earlier news
- On the menu button “Nachrichten” we show the symbol of a funnel – shouldn’t we show a wheel?
- The blue spot on the timeline doesn’t attract attention even if you know what’s it good for
- The chronological row from “yesterday” to “Friday” isn’t logical at all: Shouldn’t we either use “yesterday – the day before – some days ago” or instead certain weekdays with an exact date
- It is n o t self-explaining that the tangibles with the photographs have to be put on the panels on the display – the test leader has to explain it in advance
- How should a testing person know where to put the tangible with the portrait on it – isn’t it more probable that they will put it on the pushbutton “Nachrichten” instead of putting it on the photograph itself?
- Why should a testing person intuitively – without help by the test leader – push on the “home”-button to see a new message? It’s more probable that they will push on the 1 or on the news-button
- Where do we explain how to take a photograph of a landscape or of my dog? Can we take exclusively selfies with the pushbutton “Foto aufnehmen”? Or can we for example by pushing this button two times make the front camera ready to take photographs?
- How can testing persons get back to the starting menu, to the starting page? We don’t have “metabuttons” on the lower edge of the display, have we?



## A.2 Findings lab trial the Netherlands per test person (January 18)

### Testing person TP NL-01 (female)

Beginning with model F, then testing model A (with hard buttons and wheel)

- F1) TP clicked on messages, then used the envelope tangible. After referencing to the use of the time line the TP starts scrolling. It's not clear that the time line is in fact a time line. Once you know how to use it, it becomes doable.
- F2) TP clicked on 'messages' (as if it's a touchscreen). Instruction that use of the tangible might be handy, TP placed the tangible 'Jaap' on 'messages', later on the photo. Very handy way of usage, you just have to place a button on it. Green button with progress is handy, then you know when something has arrived/ been sent. Text was sent, didn't notice it at first, double with green circle. The latter was clearer.  
You have to have buttons yourself, how do you get your own buttons? Would be handy if you could place contact details at the buttons yourself. The names you use the most, place contact details behind them. Would be handy to be able to change the contact details at the buttons yourself (perhaps handy to be able to order the first few).
- F3) At first it wasn't clear where you could see that a new message had come in, after directions though it was clear. Works fine once you know how it functions. Second time went well immediately. TP clicked on the button messages to read the message. Once you have read the message, how do you get rid of it? How do you go back to the home screen? Message is easy to read, even without glasses, it's very handy that a message is highlighted.
- F4) TP places envelope on 'messages' and Jaap next to it. After explanation, Jaap on messages. Next step is not clear, TP wants to use envelope again. Subsequently not clear that recording has already started and that TP can speak and that you have to stop it afterwards. After providing explanation TP presses on the stop button. It's not clear to TP where the status can be found (Sent). TP would like to see if it has arrived (next to Send). Button is handy though, because you don't have to keep re-entering details.
- F5) It was immediately clear to the TP that she had to place Jaap somewhere, placed tangible on messages. First time right.

### Model A

- A1) TP scrolls over the timeline with her finger. After that envelope tangible on messages. TP didn't see the wheel, after explanation it became clear what the idea was. Wheel is handy, but no clear preference for method.
- A3) TP immediately sees that there is a new message, places envelope tangible on 'messages'. Explanation needed for pressing 'home' button. Once you know how it



works, it's clear. Both options are possible, at first instance TP expresses a preference for pressing button (easier).

A4) TP places tangible Jaap on messages. After instructions TP presses on button, then releases the button again. Subsequently realises that button needs to be held down. After instruction Jaap on message, green button with progress is handy again.

TP likes the use of hard button on device. This way is easier than the other device.

A5) TP presses on 'call', after that places tangible Jaap on 'call' on her own. Point of interest: with tangibles, you can only call people that are in your system

A6) TP immediately places tangible correctly on the screen.

#### *General comments*

TP finds device with buttons a bit easier. TP would buy device, even if it would cost 350 euro. Handiest to receive and send messages. Fun to use for games, for example cross word puzzles, Sudoku. In the past for example with grandchildren 'Mens erger je niet' (Ludo).



### Testing person TP NL-02 (female)

Beginning with model A (with hard buttons and wheel), then testing model F

- A1) TP first clicks on 'messages'. After instruction wheel it's clear that she can turn it. You have to know the wheel is there to make it easy. Message is easy to read, even the other messages are easy to read.
- A2) TP clicks on tangible Jaap, gets the instruction that she can pick up the tangible, subsequently sticks it somewhere else (not on the tablet). Then gets the instruction that she can stick it on the screen, was afraid to do this at first, thought it wasn't allowed. 'Jaap' was taken off the screen, so TP thinks picture was sent. TP hadn't seen the green circle at first, but it seems handy to her. Handy that you are able to look back at the status, because she had not seen the green circle. Worried about what could happen to the tiles, if they fall you will lose them. She will also need many tiles if she adds all her contacts (siblings, children and grandchildren, friends, more than 50 people). Would be handy to pre-program buttons, just like on the phone.
- A3) Not clear that there is a new message, clicks on messages, then scrolls over the screen. First says that she doesn't know, then grabs envelope tangible, does not work either. After instructions she clicks on the home button. It is easy though, once you know how it works. Handy, one button is easy to remember.
- A4) Places Jaap on screen and clicks on 'messages'. Then places Jaap on and next to 'messages'. After a few instructions, TP clicks on button record audio, and subsequently releases it as well. After a few times realises she needs to hold the button down. Once you know it, it's clear. Second time goes faster. Green button is handy. Can status be checked on screen? Thinks that green circle means that he received it. How can I turn this off? Back to home screen?
- A5) First presses on Home. Grabs tangible Jaap and randomly places it on the screen. After a few instructions she places Jaap on 'messages'. It takes a bit of getting used to the device, but it is easy though because of the few buttons you have to use. Would be handy if you could also do other things with it, like ordering tickets for a play.

Model F

- F1) Immediately notices that there are no buttons on device, gives the idea that it has less possibilities. TP clicks on 'messages' to see older messages. When this does not work, she clicks on 'call'. After instruction she randomly scrolls over screen with finger, after instruction over timeline. Second time she first clicks on 'messages', then scrolls over the timeline. After the second time it goes well. Once she figures it out, she finds this easier than the wheel, it's one single act.
- F3) Not clear that there is a new message. TP scrolls over timeline, then clicks on messages. After the first instruction to use tangibles, she grabs the one for Jaap and places it on the screen. When instructed to use the other button, she grabs another name. Lastly instruction to use envelope, she places it on messages. TP doesn't like the loose tangibles, she prefers to just click on messages (touchscreen) to see new message.



- F4) Places tangible 'Jaap' on messages, does not immediately see a change on the screen, after instructions she does, subsequently places 'Jaap' on audio message. Clear that she has to end recording. Clearly sees that message has been sent correctly, too bad you cannot see if it has been received. This method is simpler than on the other device. Less handling steps here, you don't have to press any buttons.
- F6) TP immediately places Jaap on Call. TP can't hear it well, how can you increase the volume? For TP seeing the other person has little added value, you see each other regularly anyway.
- F7) First time right. Sees no added value in games on the device, prefers real life games. Would be different if you have decreased mobility. Rummikub/ rummu shang hai, Cards.

#### *General comments*

Device without buttons is more convenient. Asks if internet banking is on it, would be more convenient in the future. Not much to memorize without buttons. The most convenient function is emailing, not always necessary to see someone. TP actually isn't really motivated about the digital development, both she and her husband are mobile, are both able to drive, once this changes there might be more need (lives in a rural area).



### Testing person TP NL-03 (female)

Beginning with model F, then testing model A (with hard buttons and wheel)

- F1) TP clicks on 'yesterday'. TP clicks on 'messages', then clicks on 'call'. After instructions TP scrolls over screen with finger. When asked to do the assignment again, instruction is needed again. Once you realise how it works, it is convenient. Message is easy to read.
- F2) TP starts to scroll, after instruction she picks up Jaap, has no idea what to do with it. A couple of instructions needed to place Jaap on the screen. It's not clear to TP that all details are stored in the tangible. Repeat assignment: now correctly in one go. TP knows the photo is sent due to the status display on screen. At first not clear what green circle was for, but handy to see.
- F3) After further questioning TP sees the notification where it says new message. TP grabs tangible envelope and places it on screen, then starts scrolling. After instruction envelope on 'messages' on new screen TP thinks that everything is gone. Only later sees that she has opened a new message. Second time assignment immediately correctly executed. Working with tiles takes a bit of getting used to, different names is very convenient because the details are immediately linked. Would need about twenty tiles though. It is necessary though to be able to contact other people than are on the tiles.
- F4) TP immediately starts speaking message. Scrolls Jaap along messages. After instruction she scrolls with 'Jaap' over audio message, and clicks on stop after instructions. What does 1:20 mean on the screen? Assignment second time: first envelope on messages, then Jaap on messages, search, Jaap on audio message. It's convenient although you need to get used to how it works. Convenient for short messages to children/grandchildren. We are currently still mobile, but if you are forced to stay home a lot such a device is very convenient.
- F5) TP clicks on messages, then 'Jaap' on messages. Did not realise she was finished.

Model A

- A1) First places envelope on messages, then on screen, then scrolls over screen. After instructions TP recognizes something on the left side, not immediately clear that is a wheel. After telling her she turns the wheel. Maybe with a different colour the wheel is a bit clearer, but seems convenient. It has to be clear and calm (not too busy). TP finds wheel easy, more relaxed than scrolling.
- A3) Doesn't see new message, only after instruction. Puts tangible 'envelope' on 'messages'. Then with finger on screen. Grabs the Jaap tangible. Told her to click on home. Clicking a button is easier than working with tiles, you need to get used to it.
- A4) Immediately presses on record audio and releases it. After instruction she holds the button down, keeps holding it down and staring at the screen. After instruction she releases the button again. Question: is the message sent? Not clear, further questioning, explained that message still has to be sent. Presses all buttons, after instruction she places 'Jaap' on the screen. After looking for a while she sees that



message has been sent. TP finds buttons on device convenient. As little fuss as possible.

A6) Clicks on 'call', then grabs tangible Jaap and places it on 'call.' Funny to make calls this way, really fun, TP would surely use this.

A7) First time right. Fun function to use, once you have some experience with the device. Have to be simple games.

*General comments*

See general comments TP NL-04 (husband of TP NL-03)



### Testing person TP NL-04 (Male)

Beginning with model A (with hard buttons and wheel), then testing model F

- A1) TP clicks on home. TP clicks on 'call', after instruction of wheel on the side, another instruction that this could possibly be used, TP turns the wheel. Message is easy to read, less clear without glasses, but doable.
- A2) Clicks on 'call', clicks on 'make photo', clicks on messages, after instruction of Jaap tangible: grabs envelope tangible and places it on Jaap tangible. Gave some explanation after that, TP places Jaap on photo. TP sees message is sent.
- A3) After instruction TP sees 1 at messages. Open: clicks on record audio. After instruction on use of buttons, clicks on make photo. Explanation of use Home, TP clicks on the button.
- A4) Clicks on record audio and releases button again. Holds it down a bit longer and then releases it again. After instruction TP holds button down, after instruction send message to Jaap, places Jaap on message. Functions seem convenient to use to TP, for example towards family. TP doesn't find tangibles convenient, because you're bound by the amount of tiles, TP would feel limited. Would also like to come in contact with people he doesn't have a tangible for, with such a device you start expanding your possibilities.
- A5) Places tangible Jaap in the middle of the screen, after instruction places Jaap a bit lower, after instruction Jaap on messages. TP does not clearly see that he is reading the messages from Jaap.

Model F

- F1) TP places envelope on yesterday, TP scrolls over yesterday with envelope tangible, scrolls over the top of the screen with tangible, after instruction TP scrolls over screen with finger. TP finds using finger over screen easier than wheel, more room on screen, wheel is smaller/ more limited.
- F3) TP scrolls with finger over screen, instruction that TP can use envelope, first in the middle of the screen, then on messages. Pressing home button works easier than this.
- F4) TP uses envelope, places it on games, places Jaap tile on screen. After instruction, places Jaap on message. TP places Jaap on audio message, presses stop after instruction. TP prefers last method, more convenient, message is immediately sent to Jaap.
- F6) First time right, places Jaap on 'call'. TP would use this function, convenient for example for meeting with someone or family and friends.
- F7) Places Jaap on game. Might use this, for example 'Mens erger je niet' (Ludo).

*General comments:*



TP NL-03 finds buttons and wheels easy. TP NL-04 finds that without buttons it works a bit more direct. Would purchase this if it comes with a manual.

Simple course + manual that you can fall back on would be necessary. When you hear the instruction once, you forget it and you can then fall back on the manual (has to be clear).

You have to learn through practice, then it'll go easier. Fun function would be reading the newspaper, being able to retrieve global information.



## Testing person TP NL-05 (Female)

Beginning with model F, then testing model A (with hard buttons and wheel)

- F1) Doesn't know what timeline is, "maybe that beautiful edge alongside it". She wants the text closer. I would click on yesterday, oh no, it doesn't react, hey, messages doesn't work either. Oh, now I only point and it already reacts. Yes, this is hard because I don't recognize anything. I look up many things on the PC and that's completely different. I have filled and emptied maps, but I can't relate to that either. May I try it again? O, this is the timeline. Fine, now that I know, the timeline is really close to the edge though.
- F2) Game doesn't, Call doesn't, then I'll click on messages then. Nothing happens, then timeline but nothing happens. We draw her attention to the tangibles. She hadn't looked at that yet. "Ah, yes there is Jaap". Shall I call Jaap then." But what do I have to do with those (points at tangibles)? I don't know yet. Jaap gives instruction that she can also place the tile on the screen. "Oh, that's fine." She sees that it has been sent. "I had to get used to the fact that everywhere on the PC there's something on it. Like this sent to Jaap. It's nice to have this method of checking." She wants to add some text. "That would be courteous. I haven't found out how to do that. I don't have a keyboard."
- F3) I see a 1 there. Because it's red it's really noticeable. But what if you're colour-blind? How to open: she first tries to click on the message and then on the timeline. Jaap reveals that she's allowed to use the envelope. She gets it immediately.
- F4) I think I'll click on messages, oh wait, Jaap on messages. She places Jaap on messages and is surprised that something happens. We don't think she realises what just happened, even though she took the right action. "I place Jaap on messages and on audio". She is surprised by how this works and she likes it.
- F5) "I have no idea. Maybe preprogram something. The device only does what I instruct it to." We help her along a little bit. She says: "I would like to open the messages and then store the messages from Jaap separately." She doesn't feel like it was successful. "How can I check if it worked?" she would rather have that it says she is now seeing the messages from Jaap. She thought that from now on the messages from Jaap would always be prioritized.

Model A

What do you notice?

"Much clearer. The order is different, Messages has a different image".

TP didn't see the wheel.

- A1) She says while she tries: "To messages or timeline. Try timeline or messages, or click on yesterday, doesn't do anything either. Nothing happens, maybe turning the wheel. Works fine for me. Not better than with timeline. Scrolling is more fun than wheel. Timeline is more something for a computer. I think timeline is more fun but wheel is not inconvenient.



A3) I see it by the red 1. Is clear

A4) Went well

A6) She says: "where can I find that Jaap wants me to call?" She does it right immediately. She waves to Jaap. She got it but patience is low.

A7) She actually doesn't want a game at all anymore. Did Spider in the past. Doesn't feel like it anymore. But okay, to play with Jaap, no problem. First a bit of doubt as to how, but when I said "with Jaap", she immediately knew how.

#### *General comments*

Which device is easier? "Nothing goes automatically. I don't remember which is easier, don't think one is harder than the other, with the first two I needed a little help and then it gets doable."

#### *Use of Tangibles*

Works fine. I take it will work better in reality. I would rather click something or swipe over it. Decisively: "I don't think it fits with a computer."



## Testing person TP NL-06 (Female)

Beginning with model A (with hard buttons and wheel), then testing model F

Are you familiar with a tablet? "I've never seen one before. I only have a landline. Just never had the occasion to. But you can hardly go without any more nowadays, so I want to learn. She doesn't want a lot of games on it but would like Sudoku or puzzles. And would also like to be able to order her own food and receive the information of her walking group.

First reaction: "this is small, can't I enter any groceries?"

- A1) "That I don't know, that's why I'm here". She doesn't know what scrolling and swiping is, but she does know what wiping is. What is timeline? "I suppose that it shows the time" she wonders why there's one blue ball and the others are black: "I don't know what those balls are for. Would be too small for me". She thinks the concept of timeline is just weird.
- A2) She starts by swiping enthusiastically. Nothing works, even the instruction that she has to place tangible Jaap on the photo, initially doesn't go well. But once she got it, she says: "that's just easy, but then you'd need a separate photo for everyone". The tiles are fine for her, but not with pictures on them (you would then need a picture for everyone and then when someone dies...."). She has a large amount of people in her network. Twenty or so. Just the names is fine, Tangibles are ok. Preferably just with the name, it's easier.
- A3) On the question how you can see that you received a message She says: "that will appear at the top. She wants to click on messages. When nothing happens she starts sliding. Jaap gives the suggestion to try with the home button. "Oh wait, now I see it." Places the tile with the envelope on the envelope.
- A4) "Ok, now I probably have to place Jaap on it". First tries to call, has to be told about picking up and then presses briefly on the button. Instruction to hold the button longer, TP: " that's pretty self-explanatory." The message has now been recorded, but needs to be sent to Jaap. She does take the tangible Jaap, but then does everything wrong. Eventually she places the tangible all over on the line, doesn't realise it doesn't matter where on the line ("it should be at the end of the line because then it's finished!")
- A5) Now she does it right immediately. She does think that the wheel is easier than swiping, but immediately adds some reservations: "if it doesn't get sluggish and keeps working."

Model F

F1) Presses button first, then swipes, she finds swiping easier.

F3) How can you see it? Due to the number 1. "Now I have to swipe again". Eventually, after some instructions, she grabs the tangible and says: "Once you've



done it, it goes automatically." All in all a button is easier than a loose tangible that can get dirty or lost. I prefer the button.

- F4) Sigh: it doesn't work. She doesn't realise that it actually did. She asks: "How do you turn this thing on or off?". She says that sending to Jaap is clear. Asks: "How can you see that Jaap received it?" She would like more assurances on that.
- F6) After trial and error she can call with Jaap. Says: "I could use a hearing aid". First she presses, then places the photo. Only later, after explanation, she understands that she can make a call by immediately placing the tangible. She doesn't like all those tangibles with names. It would seem easier to her to type in the name of the person you would like to call. Easier than all those tangibles. ("just imagine someone would die, you'd have to throw out the tangible")
- F7) Game first time right. Well done but she is worried because: "you need to have the right Jaap." She wants to be able to click away, because of when it's a stranger. Repeats: "I miss a keyboard".

#### *General comments*

Difference between both tablets:

With the first one I had a button on the side, I don't care for the wheel, the difference is that this one is simpler, but I do miss the home button.

I could get used to both of them.

I would have to write everything down though. We ask her if she would prefer to make her own notes or rather have a manual. "I don't really know actually."

Repeats that she would like to be able to order her own food, contact people on her own and be able to ask someone to pick her up.

And her sister told her that all innovations can be found on a tablet, you stay informed.

She doesn't have internet. "I wonder: what would I purchase or buy?"

Upon leaving she repeats that the letters need to be clearer.



## Testing person TP NL-07 (Female)

Beginning with model F, then testing model A (with hard buttons and wheel)

- F1) First reaction: How do you turn it on. How do I bring it to life? Timeline: she knows that the timeline is the dotted line. She also knows what scrolling is. On the question to search for an older message, she says: "I would press on messages. Above on the dotted line, on timeline, I would look in messages. "She feels that the timeline is a bit too much to the right, hard to get to it. It's because you say it's a line, otherwise I would have never known what it is. I like manuals. Scrolling is hard because I'm too robust for that, when I swipe it passes too quickly. Oh, now it goes on its own. I think it's funny when it does something, it comes to life. With some you have to press, but here you have to swipe. She has a preference for scrolling instead of the wheel.
- F2) First reaction: "why are the options on how to make am picture not shown. I can't make heads or tails of this. Is this a keyboard. I press on Jaap. Oh you can take it off. O, how weird, how funny. Tiles: companion has to give hint. She says: "solution is fun, but not great, I would rather type in the word Jaap. I will lose the loose tangibles, I also have pets, they will cause me to lose tangibles. It is however suited for people with a small network." Progress indicator (green circle). Is clear. 'Aha-erlebnis' when the process is finished.
- F3) First reaction: "Oh, there's a 1, no idea how to open that. Oh there's a red ball here." Needed help picking up the tile. "I think it's inconvenient, I'm concentrating on that thing, not thinking about the tile. "Home button: she didn't understand why the button was there. The letters of the text could be a bit bigger. The images are clear though.
- F4) First reaction: "How would I do that? Nothing happens when I swipe on messages. How does TP feel about the two different interaction styles? First by pressing a button or second by placing a tile on screen? O god, I have to use the tile again. Is that a difficulty for them or not? Reaction in hindsight: "I thought it was pretty funny, also practical". It's not clear when the process recording begins. Also when I ask again, a full blown No-reaction: "If I want to get out of here, how do I do that?" After explanation she understands the concept of scrolling. She keeps saying: "I want the screen to be empty."
- F5) First time right. She gets the filtering.

Model A

Reaction: "o, there's a button here".

- A1) Maybe click on messages. Oh, turning on the wheel. Wouldn't have thought of that. I can't do this without a manual.
- A3) On the question how she notices a message came in, she says: from the 1 at the messages. She would prefer to click on the envelope with the 1 on it. Then she says: "I press on home. I can exclude sound and photo so that leaves me with pressing on home.



- A4) I think I have to press on this (record). I don't know how I get it to Jaap. Instruction that she's on the right track, but she can leave Jaap on for now. "Maybe I should hold the button down. Messages I recorded. Problem is how to send it." Sigh. With our help she places it where it needs to be. "I would've never thought of that. Now that I've done it, I get it, but I'll forget it really quickly. When you do it many times, you get used to it. This is limited, if there would be more options...." (She points to my iPad of which she knows that there are many icons on it, with many options).
- A6) I don't know if it works. (When it does she waves at Jaap). She would use it. "With friends, they would also want it." Catches on quickly, because of the previous device. The functions on the left side are too limited. She would rather have more icons. And she absolutely wants a manual.
- A7) First time right. She got it immediately.

#### *General comments*

What are your impressions on the differences? She has already forgotten what she did with the previous device. "Maybe the second one is a bit easier, because you can turn the wheel." If it's in store, would you buy it? Yes but she is afraid of addiction. Upon leaving she asks: "what will I here form you?" she would like to be kept informed.



## Testing person TP NL-08 (Female)

Beginning with model A (with hard buttons and wheel), then testing model F

- A1) Do you know what a timeline is "Yes, just like on Facebook. It isn't about time. This timeline is unclear. I probably have to click on something. Jaap explains what and where the timeline is. How would you now search for older messages? "I think at the bottom, at the top, there's not much happening, then I would click on yesterday." Hint about the wheel. "Oh, I just needed to know that, that's fine." The concept of scrolling is known, that goes well.
- A2) She thinks and says: "How do I do this at home. I'm thinking. Get to work with messages. That's the idea apparently. I could also click on Jaap." After a hint that they are tangibles that can be taken off, she sticks the tangible on messages. She is surprised that by placing the tile on the photo, she comes in contact with Jaap. How does the computer know where Jaap is? Is Jaap's information stored in the tangible? She utters the question "how do I know that the photo has been sent?" She says: "confidence isn't easy for me. I would have to get used to that. I want to be sure that it's really like that. I have to get used to the tiles. I would like a confirmation of receipt."
- A3) "I see a 1. You would have to be half blind not to see that." She wants to place the tangible Jaap on it and says "if I'm not allowed to press on it I wouldn't know how". The test supervisor points to the home button. She finds this utterly illogical. "Home to me is only for when I want to go back to something that is at the basis. This is different."
- A4) She immediately got that she has to press and hold down the sound button. "Very strange that I have to place this tile on the line". (She did however get it immediately). She says: " Never worked with a tile, but hoeps there it goes, very convenient." The letters are a bit small to her.
- A5) She immediately understands that she has to place the tangibles on messages. Also understands how it works with filter. She thinks it's very clever.

Model F

First reaction: "oh, there are no buttons here." Then she also says: "I know someone who would leave now, would panic. We from our generation are control people. "It becomes overwhelming".

- F1) She says the timeline is clear: "What was it again? You have to do it ten times and then you know it again. It cracks up top. For older messages I want to go back." So she swipes from bottom to top. She wants to be able to see the newest messages at the top, just like on Facebook and in Outlook, etc.
- F3) She sees the new message immediately. Asks: "Why is there a message is you can't do anything with it?" When she hears she's allowed to use the tiles, she immediately knows how to do it. It does however take some getting used to the tiles.



- F4) Says: "o lord, how did I just do it" (we help her by reminding her that the message has to go to Jaap) "Jaap of course, oh this is easy after all. I think this is much nicer, very nice, three two one." Note: TP is Arthritis patient, her hand can cramp up. Holding on to a small button is hard. The less she needs to hold, the better.
- F6) "I take Jaap and I'm going to make a phone call. Got it right immediately. Can't hear a word he's saying. He's speaking really fast.
- F7) "I never want to play games on the PC. All of a sudden she doesn't understand the system anymore, while it was going so well before..."

#### *General comments*

Which device did you like best?

Second device is easier, but maybe also because I'm used to it.

Swiping is easier, once you get it.

I don't want to call with tablet, don't want to see the other person, can't bear to think about it. No video calling.

Facebook with godchildren.

I want a PC or a tablet. Not both, can't bear to think about that. Don't want to spend all my time on that, it seems socially unhealthy to me. I don't need to keep up all the time anymore