User-interface redesignfor the coaching environment of Council of Coaches.

Using contextual inquiry and co-creation methods to redesign the interface for Council of Coaches using interaction metaphors relating to older adults.

Bachelor Thesis
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7 November, 2019

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Using contextual inquiry and co-creation to re-design an interface and interaction metaphors for Council of Coaches to relate to older adults.

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Abstract

Roessingh Research and Development is working on the project Council of Coaches, a two-year running project to develop an application to assist people with chronic conditions in their everyday life. The idea is to create interactions with virtual coaches. One of the main goals for Council of Coaches is that the users can feel a personal connection with these characters. This report describes a design proposal for the interaction design and style of the Council of Coaches application, fitted to the specific target group of older adults using co-design methods. This design is one example of designing for a particular segment of the population of users, which eventually could be expanded to other user segments. In the first phase, the personalisation of the app and segmentation of the user groups that will be used in the design process were looked at. In the second part, earlier designs were evaluated using formative qualitative research methods and contextual inquiry. This was to see if the assumptions that were made concerning the design can be justified or improved for the target group of older adults. In phase 3, co-creation was performed in workshops with older adults in Enschede and Haarlem. It was found that the participants could not relate to the current style of Council of Coaches. They wanted to be taken seriously and did not receive this from the cartoon characters in the application and they found many attributes to bear little significance and to be distracting. This resulted in the realisation that a balance should be struck between formality and informality. In the fourth phase, the findings from the co-creation sessions were incorporated into two functional prototypes which differentiated in style (one contained a photorealistic style and one a drawn style) which were compared using a questionnaire. In the final phase, a new design was created. This contained multiple variants of the user interface of the coaching environment and different interaction metaphors. Of these variants, multiple were incorporated into one functional prototype. In the discussion, it will be discussed which aspects of this design are generic and can translate to other user segments and which aspects are specifically for older adults. The approach in this report provides a thorough understanding of the intended target group, but is time-intensive, however, and possibly unrealistic if it has to be done every time for smaller user segments. In conclusion, this project presented an example of a personalized interface for a segment of the target group of Council of Coaches using principles of co-design. One of the most important insights was the importance of early testing of assumptions. To expand this approach to new segments, we need to take into account available resources. Therefore, a framework is recommended for designing new variations of the design for new user segments where the users can quickly be involved without taking much time.

Acknowledgments

First of all, I would like to thank my supervisor at RRD Harm op den Akker for helping me around within RRD and Council of Coaches and also for helping me with the logistical issues regarding the interviews and co-design sessions. Secondly, I would very much like to thank my UT supervisor Jelle van Dijk for helping me to bring my academic capabilities to my current level and for supporting me throughout the whole process.

I would also like to thank all the people that participated in the interviews and co-design sessions for their kindness and hospitality. And last but not least, I sincerely thank Rutger, Robbert, Verena, Vera, Emily and Nicole from the student room of the RRD for the fun working atmosphere during my time there.

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CHAPTER I:

Introduction

This chapter describes an introduction to the assignment of this thesis. The project Council of Coaches will be introduced and it will be described how interaction design and personalisation applies to Council of Coaches. Then the aims, research questions and method will be explained.

1. Introduction

Because technology and medicine are continuing to improve, the life expectancy of people is also increasing. The number of people of 60 years or older is expected to more than double by 2050 and triple by 2100. By 2050, the expected percentage will increase from 25% to 35% of the population in Europe (United Nations Department of Economic and Social Affairs, 2017). Because of this, there is a growing need for health-care solutions for elderly people, as longer lifespans also introduce increasing amounts of age-related impairments (Das et al., 2019). Meanwhile, the workload on health-care employees is continuing to increase. In 2015, half of the employees in health and welfare care in the Netherlands reported that they regularly had to move their work due to increasing workloads (centraal bureau voor de statistiek, 2019).

As a result of the increasing need for innovations in health-care, telemedicine applications are growing in popularity to supplement current treatments for the elderly. These applications are ICT based solutions such as telemonitoring and teleconsultation (Das et al., 2019) which have proven to be effective tools for health-care for the elderly (Maresca et al., 2018). Commonly and effectively used telemedicine applications are mobile health (mHealth) and electronic health (eHealth) applications. These have been used to personalise the provided care to the users and to help them to take care of their condition themselves, for example by planning of exercise, scheduling appointments and tracking their own medicine (Das et al., 2019; Silva et al., 2018; Karageorgos et al, 2018). Kulyk et al. (2014) describe three main applications of eHealth:

1) **Physical Activity Monitoring and Coaching**, where wearable sensors can be used as surveillance tools to assess a person's physical activities.
2) **Mobile eHealth and Coaching**, where mobile devices such as a personal smartphone can be used to provide certain personal feedback through specific apps.
3) **Serious Gaming for Lifestyle Support**, which are entertainment media that promote healthy living.

Part of eHealth are *tailored lifestyle coaching services* (Kulyk et al., 2014). These are digital applications that help the user with personal issues regarding their health such as physical activity, nutrition or medication, mostly in the form of coaching from a digital person or by relaying the data provided by the application to specialists. Tailored lifestyle coaching services fall in the category of *Mobile eHealth and Coaching* and is the main discipline that the app of Council of Coaches, which will be further elaborated on in the next section, is based on (Dr. H. op den Akker, personal communication, 2019). Principles of *serious gaming for lifestyle support* are also applied in the app (Dr. H. op den Akker, personal communication, 2019).

1.1. The Council of Coaches

Council of Coaches is a project funded by the European Union's Horizon 2020 research and innovation programme that has been running since September 2017 (CORDIS | European Commission, 2017). It involves multiple universities and research institutes in the Netherlands, Denmark, France, Scotland, Spain and Belgium to develop an app to help older adults across every aspect of well-being including physical, social, cognitive and mental support. Currently, the main focus is on adults of 18 years or older with Chronic Pain (CP) or Diabetes Mellitus type 2 (DM2) and older adults of 55 years or older with Age-Related Impairments (ARI) (Broekhuis et al., 2018). They will be helped through coaching by a "council" of different virtual characters. These are completely virtual people with pre-programmed behaviours that will talk to the user and react to each other. All the coaches will have their own expertise, personality traits and styles of coaching. They will listen to

the user, and help to set personal goals concerning their health and help to maintain these goals. They can be contacted at any time if the user has pressing questions, but also if they just want to chat (Council of Coaches, 2019).

Figure 1: the High Council in Civilisation 2

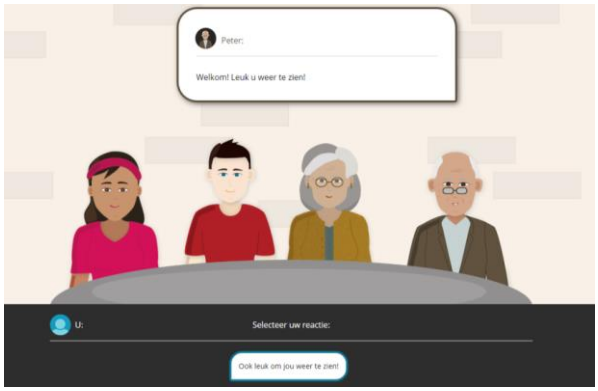


Figure 2: previous design iteration of Council of Coaches

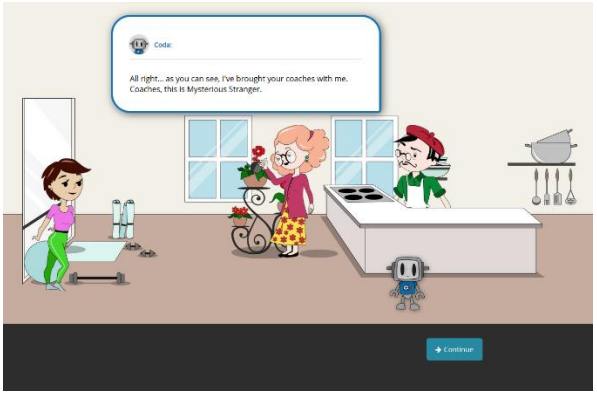


Figure 3: current design of Council of Coaches

The idea of Council of Coaches is inspired by a feature from the video game Civilization 2 from 1996, where players can ask for advice from a council of different characters that all have their own expertise and opinions. There, the council members will give their opinion on the current situation when the player asks for it. The same model is applied in Council of Coaches. Different professionals might look differently at certain issues: a physical therapist would likely come up with a different solution than a dietitian or a doctor for the same problem. By putting all these expertises together and having them discuss their ideas together with the user, the user can make a good consideration for themselves. Additionally, multiple coaches discussing with one another appears to be more persuasive than a single coach discussing with the user and is more effective in inciting behaviour change (Kantharaju et al, 2018).

To make the app appealing for the target group, Council of Coaches builds on several principles:

- **Personalisation:** The coaching is meant to take place at a very personal level. The user can talk to the coaches at any time about pressing personal issues, but also just about how the day went. Multiple different coaches can be created by developers or innovators that provide extra knowledge and ways of coaching (Council of Coaches, 2019). Because the app is meant to be very personal, it is important to understand who the users are, what the context is and how the app can relate to that.
- **Fun:** The current graphics of the app have a cartoon style to emphasize the characteristics of the coaches. This way the users can relate to the coaches and create an understanding with them. This also makes the app more fun and enjoyable (Council of Coaches, 2019).

- **Informality**: the 'home' environment that is implemented in the current design should make the setting more informal and make the user feel more at ease. The attributes of the coaches should also help to show what the coaches do all day and they will contribute to building up their character. The goal of this is to create an understanding between the users and the coaches (Council of Coaches, 2019).

Eventually, the goal will be to create an app that gives the best user experience to all the different users. However, because the target group is very broad, it is difficult to define these users. It might be beneficial for younger adults with CP or DM2 to create a very informal app that is mainly focused around fun, but the same informality and fun might be perceived negatively by older adults. Additionally, the four points mentioned above might interfere with each other or other functional requirements of the app: an app focussed too much on fun might lose the purpose of coaching the user. This report will look at the personalisation, fun and informality in an attempt to strike a balance between them to increase the user experience for the target group while maintaining the effectiveness of the app. The focus points for this will mainly be regarding the interface, including the coaching environment and interaction design, including the interaction metaphors.

1.2. Interaction design

Good interaction design is essential for a good product. It is a big factor in the user experience and eventually delivers the perceived quality of the product. Something may function very well, but when the interactions are not good, it will still be perceived negatively. "People simply stop using technologies that do not correspond in any way with their daily lives, habits or rituals" (Soares et al., 2016). Benyon, Turner, & Turner (2005) describe 4 aspects of interaction design from a user-centred perspective: the People that perform certain Activities in certain Contexts using certain Technologies or Artifacts, also referenced as PACT or PACA. In this report, the interaction design will be approached on 4 fronts: between 1) The user and the app and its different functions; 2) The coaches and the user; 3) The coaches and their environment, with for example their attributes; and 4) The user in their own environment.

1.2.1. Current interface

In one of the first iterations of Council of Coaches, the coaches were seated behind a table, as can be seen in figure 2. This gave the coaches a natural setting and makes the interactions between the coaches appear natural (Council of Coaches, 2019), however, putting the coaches in front of the user made it come across as too formal "as if participating in a high profile job interview" (Council of Coaches, 2019). It was also desirable to make it more clear what the coaches were doing the whole day, apart from just sitting behind that table. A later design iteration of the interface, which can be seen in figure 3, put the coaches together in a more informal 'home' environment where every coach has their own attributes. Council of Coaches chose to continue with this design.

This design will be evaluated to see if the assumptions that were made concerning the design can be justified or improved for the target group of elderly people. Benyon, Turner, & Turner (2005) express their concern that digital applications are designed by programmers who already often use a computer or by young designers who have had experience with video games for years and that these designers often forget that the applications or interfaces will be perceived differently by people without these experiences. The suspicion is that, for older adults, the design of Council of Coaches is too informal and too much centred around fun instead of the functionality.

1.2.2. An initial PACT analysis

In the context of Council of Coaches, the people, activities, context and technologies would roughly be shaped as follows:

- The people that are involved are in this case the main users, but the coaches can also be seen as people in this category. The user can talk to the coaches trough selecting from an arrangement of possible answers to which the coaches will respond accordingly, this is the main way the users can interact with the coaches.
- The activities can be anything that the users and coaches perform in their life that might influence the way they interact with the app. For the coaches, these are currently the things they do concerning their speciality which are enforced by their attributes. So the diet coach will stand in a kitchen and will have his cookbook, which he can show to the user to interact with it. These attributes can be seen as technologies of the coaches.
- The context of the coaches is all in a home-like setting, but the context of the users will differ greatly. The users can contact the coaches at any time during the day, whether it would be in case of a pressing situation or just to have a friendly conversation at night on the couch.
- Finally, the technologies that are involved in the interactions would be for the coaches their personal attributes or other things that they can interact with within the app. For the users, this could be a computer or tablet, but also any other technologies they use that influences their interaction with these devices.

In this report, these interactions will be evaluated on the four fronts mentioned above and it will be investigated if interaction metaphors could be implemented. Interaction metaphors simulate real-life interactions that can be familiar to the user. Thus these metaphors could be used to portray certain functions in the app in a way that that is intuitive for the user. The question will be: How can interaction metaphors be used to make the product more engaging for the user. The main suspicion here is again that the current way that the user can interact with the coaches or with their attributes does not connect with the expectations of older adults. Currently, this interaction is in a digitised way. This is common in most digital applications, where functions are made to be very clear, such as objects fading out when they are not needed on-screen. Older adults, however, might want a more realistically simulated experience. In this report, the question will be asked if the coaches should react to certain actions in a digitised way as in most current digital applications and if they can be more realistically represented?

1.3. Personalisation

That the target group of Council of Coaches involves every adult with DM2 or CP and older adults with ARI as well, means that the target group is extremely broad and that the people in the PACT analysis are hard to define as a whole. This is important to understand, as defining the right people is the basis that the rest of the PACT analysis is built on. To be able to specify the people, a separation should be made to divide this target group into multiple sections that can be specified concerning their interaction with Council of Coaches. Not only the age or the impairment of a user affects this, but many other parameters are also influencing the interactions:

As for the people, the personalities and coaching strategy of the coaches have a big effect on how the coaching is perceived by the user. For example: for a well-informed user, a coach might ask that

user what they know, so that they can correct flaws in their knowledge, while for a very uncertain user, the strategy might involve dropping subtle hints about the topic and giving compliments" (Beinema, op den Akker & Hermens, 2018). The same can be said for the context of the coaches: where the user uses the app, where the coaches are situated and how they interact with the environment all make a big difference. "Recent developments in technology change how and when people use it since technology usage is becoming more intertwined with daily life." (Broekhuis, 2018). Council of Coaches is meant to be used at any time of the day, so defining one context is difficult. For example, there is a difference between using the app at some time during the day to ask a pressing question and using the app late at night when on a couch with a blanket, just to have a conversation with the characters. At the first example, the user will be in direct need of help and perhaps needs more direct communication with the coaches, whereas, at the second example, the user would be in a more relaxed state and might want a more personal and informal conversation with the coaches. To distinguish between these different people and contexts, this thesis will investigate principles from user-customisation or segmentation to see how they could be implemented in Council of Coaches.

1.3.1. Customisation

Council of Coaches could falls in the category of mass-customisation. These are products which are designed to be modular and where the buyer can select from different options to "design" their product as opposed to buying a standard mass-produced product (Michel et al., 2009). For Council of Coaches, the users could be given the ability to change the design of their app, for example from different styles of coaches, different environments or even changing their user-interface or their interactions with the coaches.

Much research has been done on the efficient implementation of mass-customisation, but not much research has looked at users themselves and if they would want mass-customisable products over standard ones (Bardakci & Whitelock, 2004). "There is a lack of research that empirically distinguishes between positive preferences for mass-customised products and negative motivations to avoid off-the-shelf products" (Michel et al., 2009).

Bardacki and Whitelock (2004) describe three main inconveniences to mass-customisation: 1) they are more expensive due to extra complexities; 2) customers would have to wait to receive their product after purchase and 3) the users have to invest time to design the product themselves. And the user will have to accept all three points: "Provided customers are willing to accept all three inconveniences of mass customisation, they will be considered "ready" for customisation, but not otherwise" (Bardakci & Whitelock, 2004). For Council of Coaches, inconveniences number 2 is irrelevant, apart from the time it takes the user to download the app, they do not have to wait long to receive it. For the remaining issues, however, it needs to be investigated how big their impact is. If the target group of Council of Coaches is willing to invest their time in designing or compositing their app and if it is possible to manage the costs of the app as a result of the extra development costs to make it possible.

1.3.2. Segmentation

A similar approach would be an elaborate user segmentation. This would mean that the target group of Council of Coaches would be divided into small segments, all characterised on aspects that might affect how they could perceive the app. Then for each specific user segment, a different design or

variation of the design can be made to better fit app to specific users. This way, many different variations of the design should be made beforehand and one composition will be chosen for the user. The advantage of this is that the user does not have to spend their time to compose their app, but the disadvantage is that they do not have that freedom anymore if they want to.

2. Aim of this project

The goal of this assignment is to investigate how the current design for Council of Coaches can be improved to be personalised for a certain user segment. In this report, I will evaluate the design proposed by Broekhuis et al. (2019) on how it connects with the target group of older adults and propose an updated design that would improve on this from their perspective. Then for a certain segment within older adults, I will investigate what coaches would be fitting and how the interactions design could be shaped using interaction metaphors.

3. Research questions

The main research question in this assignment is: "How can the current design of Council of Coaches be optimised concerning its style, coaching environment and the interactions design to create an example of how Council of Coaches can be personalised for its target group?" This question is divided into central and sub-questions as shown below.

I) How can the current design of Council of Coaches be optimised regarding its style, coaching environment and the interactions design to create an example of how Council of Coaches can be personalised for its target groups?
    1) How can the personalisation be implemented in Council of Coaches?
        a) Which people will use Council of Coaches?
        b) What characterises these people concerning their use of the app?
        c) How could customisation or user-segmentation be implemented?
        d) Is the target group of Council of Coaches willing to invest their time in designing or compositing their app?
        e) Is it possible to manage the costs of the app as a result of customisation or segmentation?
    2) What coaching environment and interactions design could be implemented for older adults?
        a) How would this user group use Council of Coaches?
        b) What are the desired interaction metaphors for this group?
        c) What types of coaches should be used?
        d) How could the interaction design be shaped with the above-mentioned coaches and interaction metaphors?

4. Method

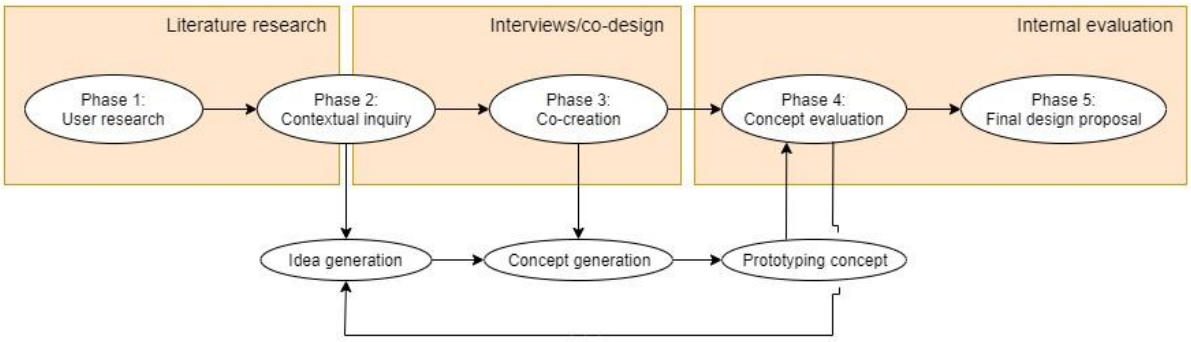


Figure 4: Design process

The aim of the project and the sub research questions are summarized in table 1 together with the method and deliverables associated with each sub-question and the methods to answer them. To answer question 1, previous reports and publications from Council of Coaches will be assessed together with publications from similar subjects. Researchers from Council of Coaches will be approached for additional information. In Table 1, this is shown as *desk research*. Next, Both Say and Make techniques (Sanders & Stappers, 2013) will be used: First, interviews will be held with older adults as part of the contextual inquiry to get an understanding of the people, activities, context and technologies of the users. Secondly, to answer question 2, the contextual inquiry will be expanded on: co-creation will be performed through co-design workshops which will form the basis of the final design. An overview of this design process, consisting of 5 phases, is shown in Figure 5 where the orange squares represent the main method that is used in these phases.

Phase 1 will consist of desk research to get an initial understanding of the target group and to find ways in which this target group could be divided. As mentioned before, previous reports of Council of Coaches will be used together with talks with developers of Council of Coaches. Next to that, a small literature study will be done on similar applications in this field and the target group.

Then, phase 2 will consist of the contextual inquiry. To explore the target group of older adults, home interviews will be held with face-to-face open questions with different people ageing from around 60 up to around 90 years old living in or around Enschede. The participants will be asked about certain aspects of their personal life such as their hobbies and their friends and family. After that, they will be asked about their familiarity with digital products. They will be given a basic introduction to what Council of Coaches is and will be asked for their opinions on such applications. In the co-design workshops, the results from the interviews will be elaborated on. These interviews will be held in the homes of the participants. This will give a better understanding of their environment because it will be in the context of use, the participants will be able to show what they do and what products they use and how (Preece, Rogers & Sharp, 2015). The questions will be held as open as possible and will be meant as starting points for an open conversation. The value of this loose structure is that we can possibly learn from it in unexpected directions (Sanders & Stappers, 2013).

Priming is important to be done individually to capture unique individual experiences and afterwards multiple people which can later come together and make collaborative actions more effective (Sanders, Brandt & Binder, 2010). This priming will make the co-design sessions more effective (Yuan & Dong, sd). However, due to limited time, there is little time for very extensive priming. The co-design workshops will, therefore, be held with people that participated in the interviews. The final questions of the interviews will be meant to make the participants think about specific actions of

Council of Coaches and will thereby act as priming for the co-design sessions. These questions will be held very openly and the goal is to invoke a conversation between the participants and the interviewer. This will create a form of empathy which will benefit the co-design sessions (Thomas & McDonagh, 2013).

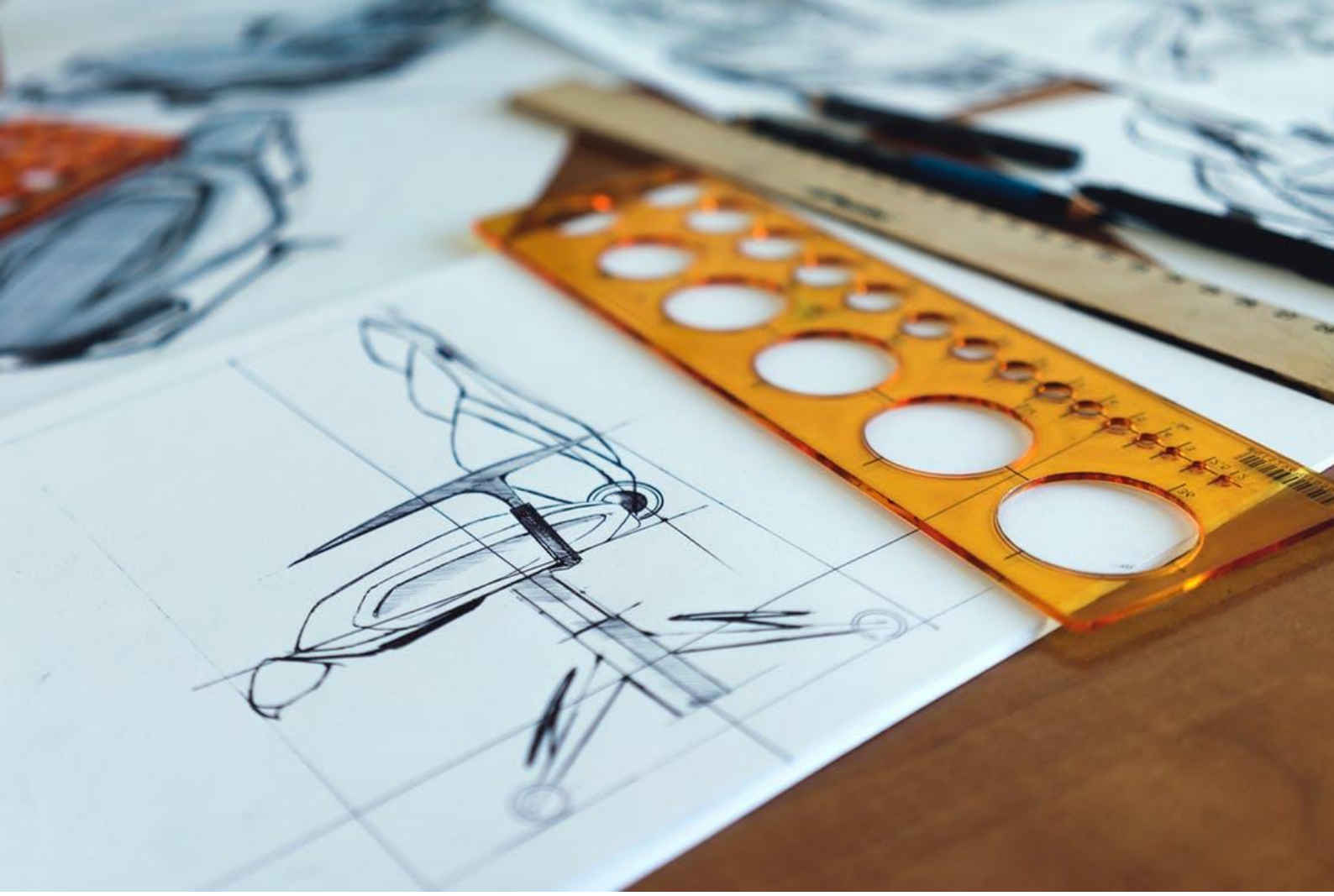
Phase 3 will consist of the co-design sessions. In these co-design sessions, the participants will be asked to brainstorm about different functions, coaches, styles and coaching environments with the help of post-it notes. During this, their opinions also will be asked about the current design of Council of Coaches among other possible designs. According to Sanders and Dandavate, (1999) the deepest level of expression is achieved through methods that are based on enabling people to express their ideas through making things and thereby gives a clearer insight in the thoughts and feelings of the participants. Therefore, after three sessions, a co-creation workshop will be done with the participants to create multiple concepts using paper prototyping. For this pre-prepared pieces will be made to functions as MakeTools (Sanders & Stappers, 2013) together with materials for the participants to freely add their own ideas as well. Sanders, Brandt and Binder (2010) say that such workshops can be done in participants' own environments, in the design studio or the research lab. The materials required for these sessions do not pose many constraints on the location and staying in the context of use, which would be the homes of the user in the case of Council of Coaches, will help the participants to relation to their own activities and environments during the sessions (Ylirisku & Vaajakallio, 2007). So to stay close to the context of the user, they will be conducted at the homes of the participants, just like the interviews.

The results from both the interviews and the co-design sessions will be taken as a basis for the design of the coaching environment, user interface and interaction design, which will be evaluated in phase 4. In Phase 5, multiple variants for the design will be created and a final design will be proposed.

Sub-question	**Method**	**Deliverable**
1a. Which people will use Council of Coaches?	▪ Desk research	▪ Personas
1b. What characterises these people with regard to their use of the app?	▪ Desk research	▪ Personas
1c. How could customisation or user-segmentation be implemented?	▪ Desk research ▪ Interviews	
1d. Is the target group of Council of Coaches willing to invest their time in designing or compositing their own app?	▪ Desk research ▪ Interviews	
1e. Is it possible to manage the costs of the app as a result of customisation or segmentation?	▪ Desk research	
2a. How would this user group use Council of Coaches?	▪ Desk research ▪ Interviews ▪ Co-design ▪ Personas	▪ Additions to personas

2b. What are the desired interaction metaphors for this group?	▪ Co-design ▪ Ideations	▪ Digital mock-ups
2c. What types of coaches should be used?	▪ Desk research ▪ Interviews ▪ Co-design ▪ Personas	▪ Digital mock-ups
2d. How could the interaction design be shaped with the above mentioned coaches and interaction metaphors?	▪ Co-design ▪ Ideations	▪ Digital mock-ups ▪ Functional prototype

Table 1: Research strategy overview



CHAPTER II:

The design

This chapter describes the five phases of the design process used in this thesis. The user research which aims at possible segmentations of the target group of Council of Coaches and an elaboration on one of these segments; the interviews of the contextual inquiry; the co-design sessions which aim to create multiple design concepts together with people from the segment from the user research; an evaluation of the proposed concepts from the co-design sessions; and a proposal for the final design.

PHASE 1: User research

Because Council of Coaches is a very personal app that stands close to the user, it can be argued that the app should be designed as specifically as possible for every single user. This would imply splitting up the users of Council of Coaches in many fine segments and creating a separate design for each segment. However, this would result in the need for many different designs which would need many resources in development.

A solution to this would be to implement personalisation or mass-customisation aspects where the user would be able to compose his or her app. The problem with this would be that the user will likely not have many design skills or knowledge about the optimal design for him- or herself. On top of that comes the question if the user would be willing to put in the time and effort to compose their app. An alternative would be to create bigger segments to be designed for. This will result in a limited number of designs, but could also make customisation options more feasible. This phase will investigate how segmentation of the users of Council of Coaches could look like.

1.1. User segmentation

Council of Coaches has a very broad target group and within this group are people with very different characteristics and needs regarding the app. Therefore, I will investigate how the users can be separated into groups with their own characteristics that have an important influence on the design. Further in this chapter, I will decide on one user-segment and analyse this group further.

1.1.1. Type of impairment

Broekhuis et al. (*D2.3: Initial User Requirements*, 2018) identifies the following three main users of Council of Coaches:

1) Older adults (55+), with age-related impairments (ARI) concerning
    a. Physical impairments;
    b. Cognitive impairments;
    c. Mental impairments;
    d. Social impairments
2) Adults (18+), suffering from Chronic Pain (CP) and possible other age-related impairments.
3) Adults (18+), suffering from Diabetes Mellitus Type 2 (DM2) and possible other age-related impairments.

The different target groups all have different people they are in contact with when it comes to their impairments and their needs for different coaches will also differ. In previous research from Council of Coaches, it was investigated in focus groups what type of coaches people desired and what type of coaches were deemed necessary from specialists' point of view (Beinema, et al., 2019).

From the specialists' perspectives, a physical therapy coach, a community nurse coach and a doctor or GP coach were necessary. Older adults desired a medical guidance coach, a diet coach, a sports coach and a mental health coach, but they did not want a physical therapy coach. People with Chronic Pain desired a physical therapy coach, an occupational therapist coach, a mental health coach and a medical guidance coach. And people with Diabetes Type 2 desired a medical health

coach, a physical activity coach, a pharmacist coach, a diet coach, a spiritual / wellbeing coach and a mental health coach. (Beinema, et al., 2019).

Separating the users on this level is a very rough separation. Splitting the users upon these criteria will result in 3 large groups with their impairment as their main reason for using Council of Coaches. This will result in that the 3 groups will still have many differences among them regarding their context, but also on personal factors. There will be a difference in how older adults use the app as opposed to the younger groups with CP or DM2. However, the different types of impairments (physical, cognitive, mental and social) will vary more between these three groups. For example, older adults might be affected more by their cognitive, mental and maybe social and physical impairments whereas just adults with CP or DM2 might be affected more by the physical impairments and social impairments.

1.1.2. Personal factors

Ages or stage of life can also be taken into account. People from a younger generation will likely have more experience using digital applications but might have less need for a very personal interaction from an app. Whereas elderly people might have less experience using digital applications, even though they are more likely to have a bigger need for personal interaction from the app (Castilla, et al., 2018). An example of this is when you would compare a hypertext structure of an app to the standard text-based structure of books or newspapers that most elderly people will be used to, the hypertext structure will quickly become disorienting. This will cause them to be afraid of getting “lost in cyberspace” because it requires more cognitive effort than linear reading (Castilla, et al., 2018).

Other factors to be taken into account are a person’s personality. This might determine a person’s preference towards certain styles of products and interfaces and will contribute to judging how people would use the app. Rockmann and Gewald (2015) describe the Big Five and investigates its relation to computer self-efficacy, which is introduced as “someone’s judgment of one’s capability to use a computer”. If a person is more introverted or extraverted in real-life, this will affect the way they will interact with other people, but this might also influence the way they interact with the coaches in the app. Other factors that are mentioned by Rockmann & Gewald are the level of empathy and open-mindedness. A person’s hobbies, dreams and fears or their culture, living and working environment can all make a difference in how they will perceive and interact with the app.

Segmenting the target groups on this area will have an effect on people’s perspective on Council of Coaches from a cultural level, affecting their understanding of the metaphors or contexts, or a personal level affecting their possible identification with the context. Splitting the user groups up with these parameters will result in many specific groups. Many small variations will affect how people will perceive and interact with the coaches. However, by doing this, a very personal approach can be taken for the design, staying close to the many different personalities inside the target group. These parameters could also be more generalised, this would result in bigger user groups which are less specific, but this does pose the risk of over-generalising the users.

1.1.3. Health intervention behaviour

Another separation could be made concerning an individual’s way of searching for information about their health condition, known as health intervention behaviour (HIB), which can be used as a tool for user-centred design for eHealth applications (Broekhuis, 2018). In Council of Coaches, three

types of HIB situations are identified: active and passive information behaviour and avoiding information behaviour (Broekhuis, 2018). Beinema et al. (2019) describe active, passive and avoiding HIB for people with ARI as follows:

1) **Active HIB:** Elderly people start searching actively for health information for 3 main reasons: 1) when they have problems with their current treatment or medication; 2) when they get feelings of anxiety, concerns or frustrations about their age-related impairments; but most of the time 3) when they are faced with their own health issues or symptoms.
2) **Passive HIB** is triggered by personal factors such as feeling fatigued or worried about your physical condition; social factors such as having encounters with your health professional, friends or just people on the street; environmental factors for example during a group rehabilitation session, at a local pharmacy or during sports training; or by medical or health factors such as physical discomfort or while receiving medical results.
3) **Avoiding HIB:** Elderly people will avoid HIB when there are no health causes when they are participating in events or activities, when they are on holiday or when they are under time constraints.

Splitting the different groups of Council of Coaches on these parameters will result in a final product centred around the user's needs from a medical standpoint. This will be a less personal oriented approach to the design of the coaching environment but on one tailored to the medical needs of the user and use of the health information. These types of HIB differ with each type of impairment.

1.1.4. Conclusion

For this assignment, I chose to separate the different users of Council of Coaches on their type of impairment. Even though it could be ideal to make many different designs tailored to more specific personalities, this would be impossible within the scope of this assignment. My attention will be on people of 55 years and older with ARI, because of practical reasons: older adults are easier to reach than people with Chronic Pain or Diabetes Type 2. It is also deemed that elderly people would be easier to work with. Also, if it turns out to be difficult to find participants, it would be possible to find people within personal circles that are willing to participate.

The target group of older adults can also be divided into sub-groups. As explained in Interview results, elderly people would have very different needs for functions in the app than older adults of around 60 years old. On top of this comes that elderly people often do not have much experience with digital products and are often hesitant to use new eHealth applications, even though they would benefit from this the most (Rockmann & Gewald, 2016). This would less likely be the case for the younger older adults (around 60 years old).

1.2. The health journey of older adults

The health journeys and preferred moments of intervention of older adults with ARI have been defined earlier in the project of Council of Coaches to get a better understanding of this target group. Beinema et al. (2019) looked at what patients with ARI, CP and DM2 go through from the moment that they discover the first symptoms of their impairment until after their treatments when they reach a stable condition. Then in these cycles, they identified the moments when people would like to get information or coaching. The health journey that they found for older adults found with ARI can be found below in figure 5. This takes into account when they first experience problems, after which their condition gets worse to finally become stable again after a treatment program.

Beinema et al. (2019) found that elderly people in this situation desired to have additional information or coaching when they first experience their first issues with ARI before they go to a hospital for treatments or tests and also after they go back home with a diagnosis and treatment program. This information gives a good first understanding of the context in which older adults would use Council of Coaches and gives a starting point for the contextual inquiry, in which the target group of older adults will be investigated further.

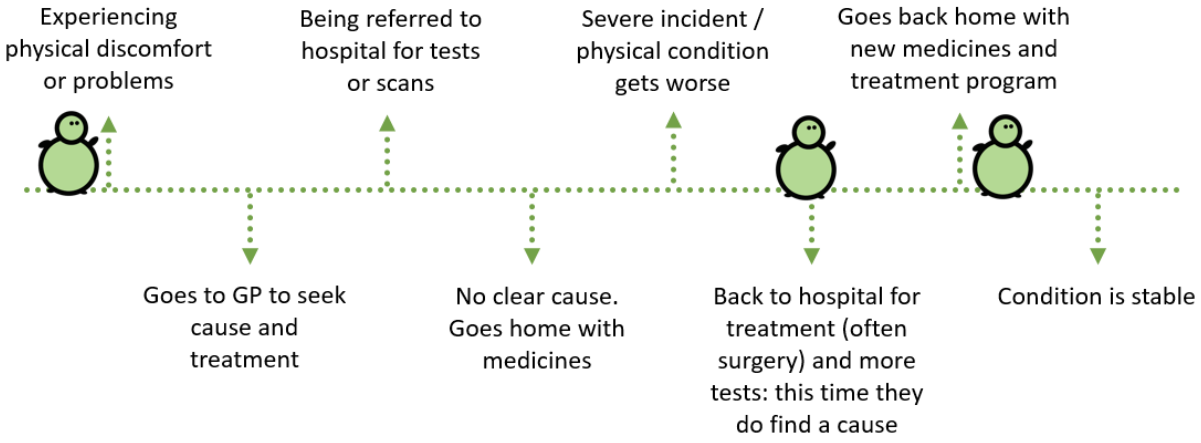


Figure 5: Health journey of older adults with age-related impairments. Each blob-coach represents a moment in the health journey where patients indicated they would have liked more information and/or virtual coaching (Beinema, et al., 2019).

PHASE 2: CONTEXTUAL INQUIRY

The health journey of older adults gives a good starting point for the user research for older adults, however, this target group is still very broad. This phase revolves around interviews to get a better understanding of differences within older adults, their activities, contexts and possible iconic technologies. In these interviews, I did not select the participants on specific ARI, because this would make it harder to find people and it was assumed that most people of this age would have some form a disadvantage because of their age. This assumption turned out to be correct for the people that were interviewed. 7 interviews were held with people ranging from around 65 to 90 years old, 3 male and 4 female participants. All interviews were held at the participant's homes: 4 people (from around 65 to 70 years old) lived together with their partner in a regular home; 2 people (from around 80 years old) lived together with their partner in apartments in an elderly apartment complex; 1 participant (around 90 years old) lived alone in an elderly home. All participants signed an informed consent form that can be seen in Appendix A.

2.1. Interview goals

The main goal of the interviews was to get an insight into the lives of these people, but also to get insight into how they would respond to and possibly use Council of Coaches. This information led to three personas which will be used to guide and evaluate certain design choices later in the design. They can be used the same way in Council of Coaches, but with less weight behind it due to the small sample size that the personas are based on.

The main questions that were asked in the interviews were about who they are, what keeps them busy and what they do in their free time. The specific questions can be found in Appendix B. The participants were also asked questions about how getting older affected them: the things that they cannot do anymore or what they do more now; if they regularly see friends, neighbours and family, and how this compares to 10 years before; and finally what they physically cannot do anymore because of their age. Also, all participants were asked about the kind of products they use with an emphasis on digital products: if they read a lot, they were asked if they preferred paper books or an e-book; do they have a smartphone and if they use it a lot and for what. The same was asked if they had a computer, laptop or tablet. This was to judge the participant's computer self-efficacy, which is the key factor of 3 determining factors in how elderly people accept new digital technologies (Rockmann & Gewald, 2016).

The second goal of the interviews was to get the opinion of the participants on the concept of Council of Coaches. This would lead to their desires for new functions that have not been considered yet in the project but also to get an indication of how they would like to use it. Results from this will later be elaborated on in the co-design sessions.

2.2. Interview results

The results from the interviews are represented by 3 personas which are shown below. From the interviews also came many recommendations for Council of Coaches, of which some will be addressed in the co-design sessions. All comments about the app and its use can be found in Appendix C.

It also became clear from the interviews that the target group of older adults can be separated into four groups when it comes to their use of the app. According to Moschis (2003), segmentation based on a person's life events and circumstances is more effective then segmentation based on age. From the interviews could be concluded that older adults can be segmented in the following categories concerning the circumstances in which they would require health information:

- **Almost or just retired adults:** they generally live together at home with their partner. They have little to no ARI and are generally well known with digital products.
- **Elderly people living together at home:** they will generally have more ARI and therefore need more help. This help is not always available and thus, they will be more dependent on eHealth. Their familiarity with digital products will differ greatly. Some elderly people have good self-efficacy when it comes to this, while others are very hesitant to use digital products.
- **Elderly people living alone:** In essence, they are the same as the elderly people living at home, but they will need more personal help. They are alone a lot of the time, while they might not be able to care for themselves.
- **People living in an elderly home:** They generally also live alone and need more help. Their self-efficacy when it comes to digital products does differ, but most of the people in this group will not be familiar with them.

Persona 1: Martin Janssen

Name	Martin is 68 years old and lives in Enschede together with his wife Ageeth. He has **recently retired** from his job as a civil engineer.
Goals and motivations	He still likes to do a lot of **sports** such as running, swimming and cycling even though he is starting to have **heart problems**. For this, he would like to have help. He wants to talk to people with similar problems because he never gets one definitive answers when he talks to experts.

Living situation	He lives together with his wife in their own house just outside of the city. There, they have a good bond with their neighbours who form a **small community** where everybody looks out for their direct neighbours if they have issues. He and his wife take care of the household by themselves and they always take the bicycle when they get groceries in the city. At the moment they still do this on a **normal bicycle**, but they are considering buying an electric bike because cycling is getting harder. For him because of his heart and for his wife because of her bad knees. **Friends and family** regularly come by to visit. He is often abroad with his wife, so when he comes back, he will visit his friends again and his son will come by regularly.
Skills and hobbies	He likes to read. His wife has an e-reader, but he still prefers **paper books** because he finds that it reads more easily. However, he does not have much experience with it yet. It would be nice to have one for on vacation so that he doesn't have to bring a stack of books. He loves to be **outside**. From time to time, he will be working on the moorlands and otherwise, he can be found working in the garden of his home or working on something in his wood workshop. Now that he is retired, he is a lot more active. Back in the day, he would not have much time outside of work where he would not be tired. In the weekends, however, he would be free and so he would make trips with his wife with their caravan. He loves to go running or cycling regularly, but because of his heart, this is getting harder. He always needs to bring his smartphone with him when he goes cycling. Not because he wants it, but because his wife wants him to so that she can reach him or he can use **google maps** if he gets lost. He uses his smartphone regularly but never misses it when he forgets it.

Persona 2: Jeanette Heijkoop

Name	Jeanette is 81 years old and lives in an **apartment** in Enschede together with her husband Pieter.
Goals and motivations	She has **trouble walking**. Part of the reason for this is because of rheumatism in her muscles. She has also been in intensive care in the hospital due to heart failures and has a **pacemaker**. To help her cope with these problems, she wants to have people to talk to about it and that can give her tips. She would also like to know where she can find correct information because she regularly finds wrong information on the internet. For her husband, she would like to learn more about **dementia**, since he is slowly showing serious signs of it.
Living situation	She lives in an apartment with her husband. They are happy that they have their apartment after they sold their old house 15 years ago to their daughter after it got too big for them. She and her husband still cook themselves, but the groceries and housekeeping are done by their **informal care** and every weekend, one of her children comes by to visit. Also some times in the year, for example for her birthday or mother's day, the whole family will come together in her apartment.
Skills and hobbies	In the past, she went a lot on vacation with the caravan club that she and her husband were with. At the moment they don't go anymore, mainly because of her **increasing problems** to do many things for a long time, but they still frequently have contact with the people they met there. At the moment, her days consist of a **small walk** around the block after breakfast, going to **physical therapy**, **writing** and mostly listening to **classical music or watching television**. The latter she can't do when there is football on television because then her husband will have it. She also likes taking pictures and making photo albums. She **used to be very active** and have many hobbies: she used to help refugees and teach them Dutch; she worked at the 'Leger des Heils'; and loved to go cycling, but she can't do most of that anymore. Now, she is looking for new things that she can do and hobbies she can pick up. She often uses digital products such as her **smartphone and laptop**, but only for certain things: her phone for calling and messaging people and her laptop for writing emails and making her photo albums. If she has to learn a new application, she often **struggles**. Her son can help her with it, but she will usually avoid it herself. She also has n e-reader, but she does not use it very often, because she prefers the feeling of a **paper book**.

Persona 3: Hanneke Korthorst

Name	Hanneke is 89 years old and lives for 3 years in an **elderly home** in Enschede.
Goals and motivations	She had a **knee implant** 3 years ago with which she has problems now. After she had the choice of a new implant or a **knee brace** that she has to wear sometimes, she chose the latter, however, she does not like to wear it. She also has some exercises that she has to do every morning. For these things, she would like to get motivation and feedback.
Living situation	She lives alone in an apartment in the elderly home. She still does her **own housekeeping** and goes to the store to buy bread, but she does eat dinner in the **restaurant of the house** every evening. She **frequently gets visits** from her children and their families and also from her brother who lives nearby. She also visits other people in the elderly home regularly and joins the **activities** that are organised by the house such as dance workshops and contests in classic games such as Jeus de Boules and shovelboard.
Skills and hobbies	She is **unfamiliar with digital devices**. She does have a laptop and a tablet, but only uses them with help from her son. At the moment, she watches a lot of television and uses an old mobile phone so people can call her. Now that she lives in an elderly home, she is much **less active** than she used to be. Back in the day, she was always busy with work or taking care of the children. She and her husband ran their own company where she would do the accountancy and worked in the shop. There was not a lot of free time, most of the spare time was spent on work. Then when she was retired and the children went out of the house, she loved to sow or to visit friends. She was also always busy in the garden, but when she began having trouble with her knees, she began having **trouble taking care of herself** so she had to move to an elderly home. Now, she likes to **walk** to the shopping centre or the park, but when she is there she will have to **rest** before she can go back. Her morning mostly consists of reading the newspaper and watching television and in the afternoon, she will be visiting her friends in the home or be receiving family.

PHASE 3: CO-DESIGN

From the interviews came certain recommendations for functions, coaches and styles. In the first two sessions, they will be further elaborated on together with the functions, coaches and styles described by Council of Coaches (Beinema et al., 2018; Beinema et al., 2019; Council of Coaches, 2019) in a brainstorm. The outcome will then be used for the first iterations for concepts for the coaching environment and interface. These concepts will be used as a starting point in session 3, a dedicated co-creation session to create multiple paper prototypes which will be used as a starting point for a separate ideation. All participants again signed an informed consent form that can be seen in Appendix A.

3.1. Sessions 1+2

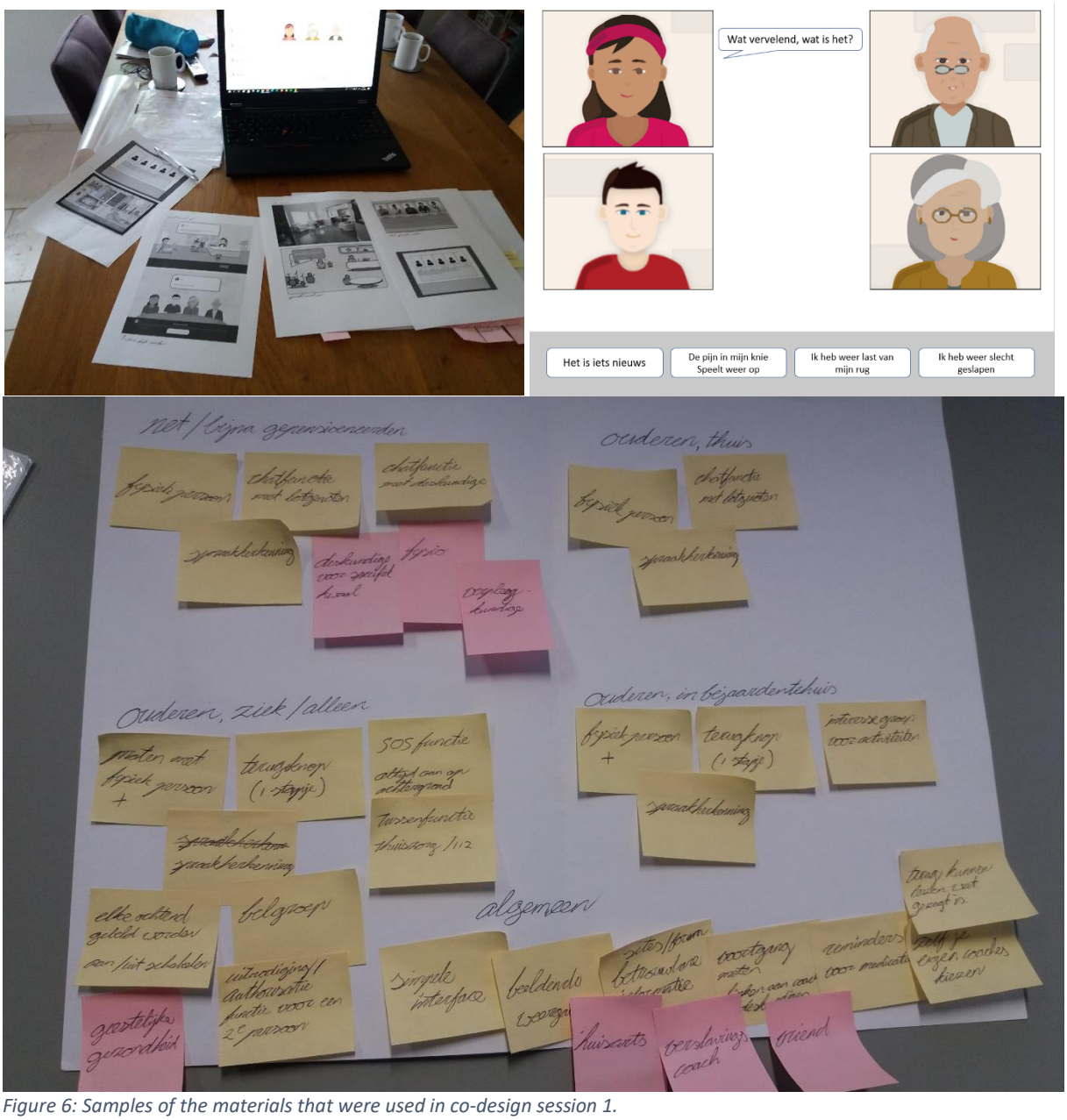


Figure 6: Samples of the materials that were used in co-design session 1.

The goals of sessions 1 and 2 are to evaluate the functions that were given in the interviews and think of what is still missing. Next to that, the styles and metaphors that are currently being used in the development of the app are evaluated among other designs and there will be a brainstorm about different designs.

Session 1 was held with group 1, consisting of 2 people: a man and woman of both around 70 years old who are living at home, both with minor but increasing ARI regarding increasing asthma and heart problems. This first session consisted of brainstorms about the different functions that they would like to see in Council of Coaches for different kinds of older adults and the kind of coaches they associated with those. This also doubled as a check for their opinion on the coaches that specialists wanted to see: a physical therapy coach, a community nurse coach and a doctor or GP coach, but also to check if they also wanted to see a medical guidance coach, a diet coach, a sports coach and a mental health coach. Which were found in previous research for the project (Beinema, et al., 2019). After that followed a demonstration of multiple short demos that demonstrated different interaction metaphors, such as a Skype conversation, a WhatsApp conversation and 2 current concepts of Council of Coaches. Afterwards, we brainstormed about the interaction metaphors for the app, the styles for the coaches and different kinds of environments.

Session 2 was held with group 2, also consisting of 2 people: 2 women of both around 65 years old who are living at home. Both women also had minor but gradually increasing ARI regarding knee problems and fatigue. One of them had a preference for alternative medicine such as haptic or chiro therapy rather than the traditional medicine prescribed by the doctor. This second session was mostly similar to session 1, but we also discussed the outcomes of session 1 after every part. The outcomes of both sessions are shown below.

3.2. Results from sessions 1+2

3.2.1. Functions and coaches

The functions and coaches that were mentioned in the sessions are summarised in the table below and will be further elaborated on later. They are divided under 4 different groups of older adults: The almost or just retired adults, elderly people living at home, elderly people living alone and finally people living in an elderly home.

Types of older adults:	Functions	Coaches
In general	▪ Simple interface with many visual representations ▪ References to trusted websites/forums ▪ Measuring progress and linking this to the coaches or specialists ▪ Reminders ▪ Choosing your own coaches ▪ Private conversations with one coach ▪ Reading back what has been said ▪ A physical person	▪ GP/doctor coach ▪ Addiction coach ▪ “Friend”/Peer coach ▪ Diet coach ▪ Haptotherapist coach
Almost/just retired	▪ A chat function with fellow people	▪ Specialists for a

adults	▪ A chat function with specialists	specific problem ▪ Physical therapist coach ▪ Nurse coach
Elderly: living at home	▪ A chat function with fellow people ▪ A chat function with specialists	
Elderly: sick/alone	▪ Voice recognition ▪ An SOS function ▪ A Physical person ▪ A button to go 1 step back ▪ Being called every morning ▪ A call group ▪ Inviting other people	▪ Mental health coach
Elderly: in an elderly home	▪ Voice recognition ▪ A physical person ▪ A button to go 1 step back ▪ An interest group for joined activities	

Table 2: Functions and coaches proposed by the participants for 4 types of older adults

3.2.2. Metaphors, styles and coaches

The main issue that came up in both sessions was that both groups preferred realism over the cartoon style, mostly when it came to the coaches and that they didn't want it to be too busy on the screen.

Metaphors

Figure 7: The metaphors that were shown to the participants.

In the demo of the mixed metaphor, it only showed three coaches. This demo was made first and due to a lack of time could not be updated to four coaches. This did not seem to be noticed by the participants, so it is unlikely that it affected their decisions.

- **Distracting:** The first picture of the coaches standing in the room with their own objects was deemed too cluttered with distracting objects. According to group 1, it would not be necessary for all of them to have attributes as it does not make it more interesting and only more distracting. Group 2 thought it was too informal. Both groups preferred the coaches around the table because it was a lot calmer and more to the point. Also, this conveyed more that the coaches were listening to you. However, his setting does provoke the feeling that the coaches are all sitting up against the user, which was also mentioned by Beinema et al. (2019).
- **Skype, chat and mix:** Regarding the skype conversation, the chatbot conversation and the mix between these (the final image of figure 4), group 1 preferred the chat metaphor because they were already used to WhatsApp.
- **Reading back:** Both groups also thought it was an important function to be able to read back what you and the coaches have said. Group 1 thought it could be implemented together with the coaches around the table where the chat conversation would be a separate screen you can go to. The skype conversation was nice, but they did not like that you could not see what has been said before. In the mixed metaphor, this was better, but they did not like that you could not see your own answers back. Also, they mentioned that the text should flow in from the bottom to top instead of from top to bottom so that when you read it back, it is in the right order.

Styles

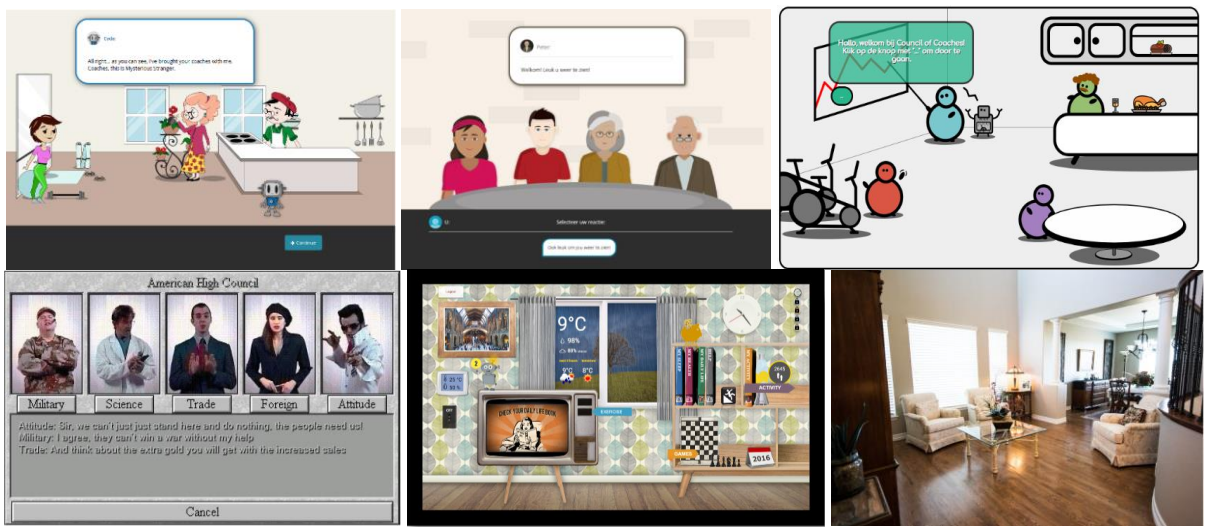


Figure 8: The environment styles that were shown to the participants.

As for the style, the participants were asked to think of styles that would appeal to them. Then they were shown the above pictures and asked about their opinion or further input. Group 1 could not think of many ideas at first, but after seeing the pictures they could get inspiration from them.

- **Realistic:** Group 1 preferred a realistic setting, however, the pictures of the living room and the e-wall interface where again too busy or distracting. They again also liked the simple style in the picture of the coaching sitting behind the table.

- **Civilisation 2:** Additionally, the image of the civilization 2 interface also appealed to them for its environment, this was mainly because of the realism. Group 2 said the same about the Civilization 2 interface, but they preferred a different style. They liked that you could click on one person to get their opinion: maybe they could refer to each other if someone else had something to say. This would give all the control to the user but would partly get rid of the dialogue between coaches as well.
- **Council of Coaches interfaces:** Both the Council of Coaches interfaces of the blobs and the cartoon characters did not appeal to group 1 and 2. This was because they were too busy, there was too much on the image that was not interesting to the user. Also, they could not relate to the styles. According to group 2, the cartoon version of Council of Coaches was hard to take seriously: they claimed that they would be much more tempted to not take it seriously and to just "mess around" with it. They specifically opted against it.

Coaches

Figure 9: The styles of coaches that were shown to the participants.

Regarding the coaches, the participants were first asked to brainstorm on certain styles of coaches. Afterwards, they were then shown pictures of the simple coaches, photos of people, pictures of the coaches in cartoon style and a photo of the 3D modelled coaches.

- **Realism:** Both groups had a preference for the 'real' coaches because they are recognizable. According to the participants, real facial expressions and body language would have positive values in how people would perceive them. However, this should not distract too much. Group 2 had the idea of using a picture of the doctor, dietitian or other specialists themselves. However, this would cause that character would be perceived as the real person and the things that the character sais could be interpreted as if that person said it himself, even though this will not always be the case.
- **The cartoon characters** were over the top according to both groups. According to group 1, it should not be too comical: for some people, it might work, but for them, it merely came across as distracting.
- **The 3D modelled** coaches fell off, mainly because of the lack of detail on the models and the background seemed too distracting. It could be better if the coaches were made in more detail and with a proper background. However, in this way it did not appeal to them.
- **The simply drawn coaches** were a good alternative: they were not distracting and still recognizable. One issue was that it was not clear yet what type of coach they were, they were too generic, but this could be improved with some changes to their clothes and some small attributes.

3.2.3. Functions to elaborate further in co-design 3

- **Reminders** for example for taking medicine was mentioned by group 1 and confirmed by group 2. This could be done through the coaches when the user visits the app frequently enough or through notifications, which would not fit the purpose of Council of Coaches. Therefore, these points will be translated into a way to convince the user to keep coming back to the app.
- **Reading back** both the answers that the user gave and things that the coaches said was mentioned by both groups. This could be achieved by presenting the text underneath each other or by using a back/continue button to go back one step so that the text is displayed again.
- **A back button** was mentioned to be essential. Not just for going back and forth between interfaces/functions, but also to undo just one tiny step. This came from the observation during the demo that sometimes the participant clicked in the wrong place or clicked twice, already clicking the next answer. Having something to undo just a small mistake will eliminate the frustrations when this happens.
- **A simple interface** with many visual representations should eliminate the need to read much text and make it quicker to understand the essential functions.
- **A physical person** was something that came forth in from both groups and from multiple interviews. People will want to talk to real people when it comes to important health subjects. However, talking to real people is not within the scope of the current project. It can be considered if it can be implemented in another way by presenting the coaches as “real” characters or by implementing a function to talk to a specialist in a later project for Council of Coaches.
- **Muting a coach** or removing a coach if the user does not want to hear what they have to say.

These functions will be elaborated further in the third session.

3.3. Session 3

Figure 10: The materials used in co-design session 3, including some elements that the participants brought up.

The goal of the third session was to create paper prototypes with the participants for the coaching environment and the interface, taking the results from session 1 and 2 as a starting point.

The third co-design session was again held with group 1. At the start, it was briefly recapped what was done in the first session and they were informed of what happened in the second session with group 2. The outcomes of session 1 and 2 were mostly very similar, but some of the differences were discussed at the start of this session.

After that, the participants were shown different cut-out pieces such as different tables, backgrounds or different coaches. They were asked to arrange these within the tablet frame in the way that fitted the best to the concept of Council of Coaches in their opinion. Next to the premade pieces, they were given different sized blank pieces of paper on which they could draw and cut out shapes. Multiple arrangements were made and the three that the participants were most satisfied with are shown below with an explanation of the choices behind each element. The goal of this is to see if the metaphor of a group conversation with the coaches in front of you is desirable over other metaphors such as the chat metaphor or the mix of the chat and face calling metaphor, as seen in session 1 and 2, or something different. The paper prototyping will help the participants to express their thoughts as much as possible.

3.4. Results from session 3

3.4.1. Concept 1

Figure 11: The first concept as put together by the participants.

1) The participants considered the drawn coaches but preferred the more realistic ones. They could relate to them more and preferred to have the impression that they were talking to a real person instead of a digital one. They recognised the issue of the user feeling intimidated sitting in front of the rest of the coaches, so we brainstormed on how to solve this. Eventually, they decided on having the coaches al sit around the table instead of just opposite to the user. This way the user can feel more included and not up against all the coaches.
2) With realistic coaches, a realistic background would make more sense. In the previous co-design sessions, both groups mentioned that they did not want too much distraction in the image, but in this session, the participants also did not want a completely empty room. The idea of just a wall was discarded because the 3D room felt much nicer. The participants liked the room with a big window looking out to a calm landscape, so this was quickly chosen.
3) After the room was chosen, one participant immediately wanted to put a plant on the shelve. This would add to the atmosphere of the room, but could also be used as a metaphor for how often the user uses the app: it could slowly die if the user does not use the app often enough or it could blossom and grow more flowers when the user uses the app often.
4) Both the rectangular tables seemed too static to the participants and a round table would also add to the feeling of not sitting up against all the coaches. For this reason, the small table was chosen and put down with its top just above the text bar.

5) The participants were shown light and dark blue bars and a white bar. From those they preferred the light blue one, as it was a neutral and light colour which they thought fitted best. They also considered a light green as an additional possibility.
6) For the text balloon, there were no prepared assets. The participants thought of multiple different text balloons from square blocks to thought balloons. In the end, the round speech balloon was chosen, but the square balloon with rounded corners was also considered.
7) Similar to the text balloon, the round balloon and square with rounded corners were considered as they fitted with the text balloons. The square box with rounded corners was selected because the participants considered that putting text in it with potentially limited space for the object to grow in size would be more practical.
8) Regarding the functions that are shown on screen, there should be as little as possible on screen. Only the essential functions should be visible. The rest should be accessible from a different screen, but not via a button on the main interface. “A pop-up screen will scare older users”, but a drop-down slide that emerges from the button would be possible. Just as long as it’s clear where it came from and that it popped up because the user pushed the button. Muting a coach can be done by clicking on a profile picture in the top-right of the screen. To make this clear to the user, the following was discussed: using icons that are frequently used to mute somebody’s sound in programs like Skype would help, but might not be recognised by elderly that do not have much experience with such programs. In the end, it was decided to simply put text underneath the pictures along the lines of “to mute someone, click his/her photo”. Clicking here could make the coach more opaque (not disappear) and put a red line or cross through their photo.
9) The next and back buttons were placed left and right of the screen just above the answers. Putting them next to each other was considered, but this seemed less intuitive. Having an arrow in them was preferable, but some text would also make it clearer to older users. Combining them did not pose more disadvantages, so this was chosen.

The essential functions would be muting a coach, going back a sentence and continuing (see point 9) and a function to talk to a coach in private (which is further elaborated in concept 2).

The participants were asked in which way they preferred the coaches to interact with each other. It was suggested that they would all look at each other and look over each other’s shoulders to see each other’s objects if this was relevant, but the participants preferred the coaches to stand still with some but minimal interaction with each other. This was again because this would not distract too much and would keep the conversation more serious.

Another point the participants mentioned was that it would be nice if the cursor could be made bigger and or clearer on the computer version. This would make it easier for the elderly to find it and not frequently lose it.

3.4.2. Concept 2

Figure 12: The second concept as put together by the participants.

The participants found it nice if there was a function to talk to a single coach. This point was also brought up by group 2 before.

1) If the user wants to talk to a coach in private, all the other coaches would disappear and the single coach would sit in the middle of the table.
2) It was considered to put the table closer or to make the table and coach bigger so that the distance between him and the user seemed smaller. In the end, however, it was decided not to do this and also to keep the rest of the interface the same as while talking to all the coaches.

3.4.3. Concept 3

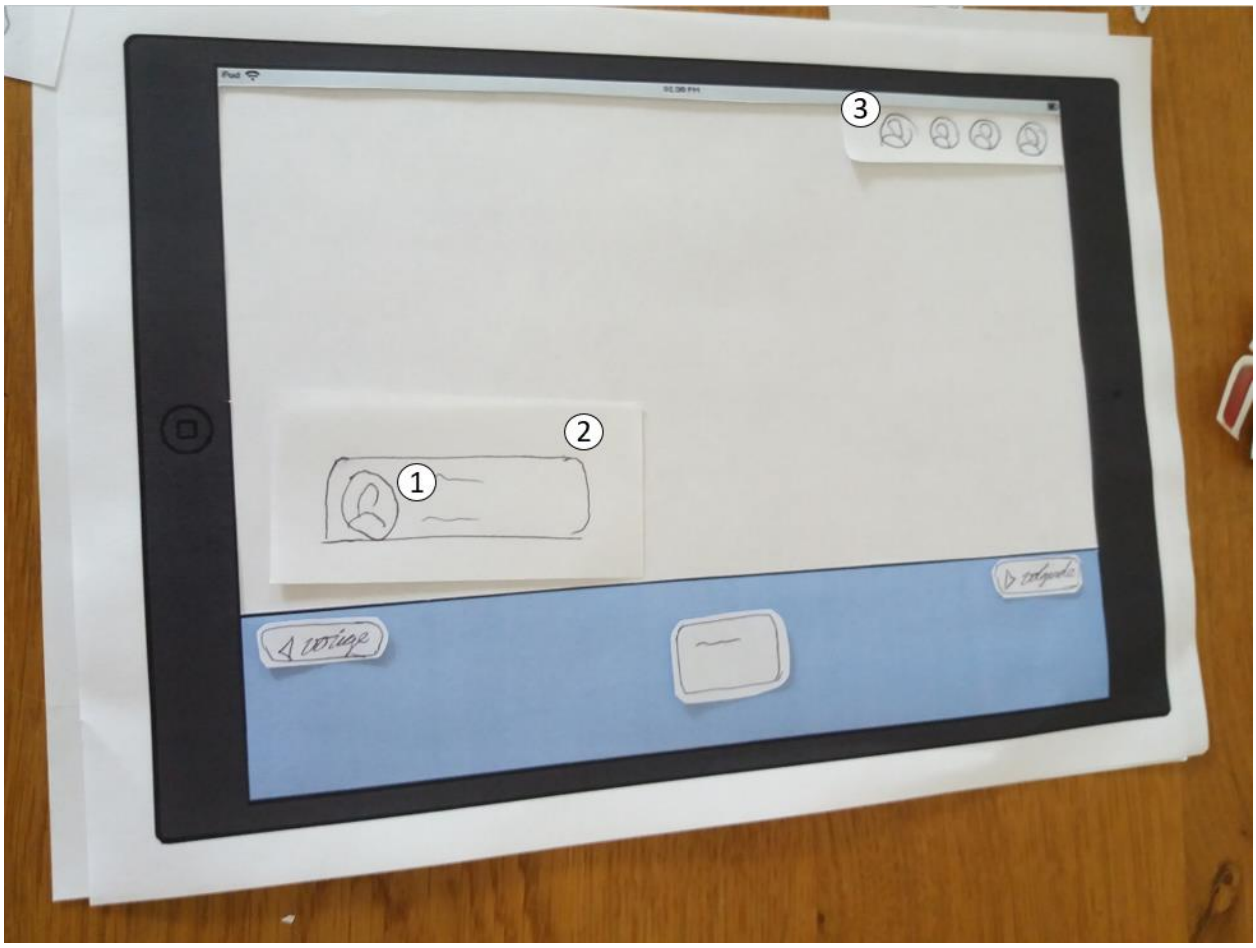


Figure 13: The third concept as put together by the participants.

A completely different third concept was also discussed. This came from that both groups said to want to be able to easily read back what has been said before. Group 2 preferred a metaphor of a chat conversation because they were already used to WhatsApp and other chat apps. It was considered to have figures of the coaches stand next to each other on top of the screen and their text coming up underneath them borrowing aspects of a face-to-face Skype conversation, as was also discussed in sessions 1 and 2. However, the participants preferred the chat set-up because it seemed more practical.

1) The participants wanted that in each message it was clear who said it. It was considered to put the names or functions above each message, but a picture of the coach seemed nicer, both for older users as for users that are already familiar with chat applications.
2) Also for the text blocks, multiple variants were considered, but simple rectangles with rounded corners fitted the most. It was decided to have one of the bottom corners not rounded off, also used in other Council of Coaches concepts, making it even clearer where the text comes from.
3) Having pictures of all the coaches in the top right was preferred. This way the user can see which coaches are participating in the conversation or could mute one like in concept 1.

3.5. Conclusion PHASE III: CO-DESIGN

The conclusion from these co-design sessions is that the current style of Council of Coaches is not what the participants preferred to see in such an app. Instead, they preferred either more realism or more serious-looking coaches. The metaphor of a group conversation with the coaches sitting around a table in front of the user was deemed more optimal and will be used further in this project. However, the chat-bot interface, as seen in concept 1, was also liked because of the ability to easily read back what has been said. This function can be accomplished with a simple back key for the rest of this project, but it would be less convenient. For the Council of Coaches project, I will advise looking into this option further as a possible supplement for the app.

From the 3 concepts that were created in these co-design sessions, the second and third concept are functionally very different from the current direction of Council of Coaches. For this thesis, concept 1 will be iterated on further. The main reason for this is that it would still be more feasible to diverge the style of Council of Coaches rather than adding another completely different function and style as in concept 3. Concept 2 could be feasible to still be implemented but would require more work to develop, because it adds an entirely new function. The design of concept 2 could be kept the same as concept 1.

3.5.1. Intermediate recommendations

From the interviews and co-design sessions also came functions and ideas for Council of Coaches that I cannot implement in this thesis, but are interesting for the project or for future recommendations. They are listed and explained briefly below:

- **Choosing your own coaches** came up in both sessions. It is considered in the project that every person can have their composition of coaches, but if they are chosen for the user or by the user is not decided yet. The participants, however, mentioned that they wanted to have the autonomy to choose the coaches themselves. For one of them, the reason was that she was more into the alternative medicine and would also like to have coaches for this, but thought that they would not be assigned to her unless she would pick them herself.
- **References to trusted websites/forums** was also mentioned in interviews as well as in group 1. Pre-defined chat options would never be able to tackle very complex situations or have the newest knowledge. The participants wanted the app to recognise when what it offers is not sufficient and would then refer to trusted websites where the user can read the information themselves. In another case, a participant said that they struggled with finding correct information on the internet. The app could help with this by suggesting verified websites.
- **Measuring progress** and linking this to coaches or specialists was mentioned by group 1 and verified by group 2. They wanted the progress to be measured by giving scales from 1 to 10 for the pain they felt or other symptoms. This could be picked up by the coaches and used in their conversations or be linked to their doctor.
- **Chat functions** with other people or specialists and an option to invite people to this conversation were mentioned by group 1. The reason for this was because that wanted to be able to interact with other people: either in the form of a forum with people with similar problems or by the ability to contact the person they are in contact with for their health problems.
- **A call group** means a group of people that are in contact with each other that will regularly call each other on specific times to check on each other. Then if somebody does not answer,

the group knows there could be something wrong with that person. This will be most interesting for people that live alone and do not see many people.

- **Interest group** would be nice to have for people living in an elderly home. This group will consist of people with similar interests and would regularly organise activities. This was mentioned by group 1, but it would be debatable if it should be in the interest of the Council of Coaches.
- **SOS function** possibly with voice recognition. The idea of group 1 is to have such a function to call if they need help. They could be directed to a person who would ask them what is going on and will connect them for example to the emergency services, home care or their doctor. Voice recognition could be implemented in the background in the future for when the user is not able to use the app or their phone but could talk to their phone or tablet and call the emergency services that way.
- **Being called every morning** to check on the user how it is going was mentioned in the interviews and confirmed by group 1. People who are sick and alone would want to have this. This used to be done by home care in the Netherlands, but less nowadays.

PHASE 4: CONCEPT EVALUATION

Figure 14: Set-ups of demo 1 and 2 respectively.

From the co-design sessions arose that the participants preferred the realistic coaches over the drawn characters because they desired more realism. The reason for this might have actually been that the participants wanted to talk to real people. This creates the question if putting pictures of real people in the app in a realistic environment but with scripted answers would result in a more realistic setting or if it would be perceived as fake.

To answer this question, two demos were made in PowerPoint, both with the same scenario. Demo 1 had a sketched style with sketched characters and demo 2 had the same set-up, but with a photographed environment and pictures of real people. The scenario was that the user had just been given the app after seeing a doctor for pain in their neck. The coaches then introduce themselves, ask about the pain and finally, the doctor coach and physician coach pretend to give information about medical treatment and physical exercises respectively.

Because of time constraints, it was not possible to show the demos in-person to people from the target group, which would have been desirable. Instead, it was mailed around to multiple people from different ages together with a questionnaire. They were asked to fill out the form and send the email to people they knew. In the end, 8 people filled out the form of whom 2 people were from the ages of 55 to 70 with a university background and 1 person from 35 to 55 years old with a higher professional education background. The survey consisted of 3 parts: 1 part about each demo individually and 1 part comparing the two demos. In the individual parts, the participants were asked how natural the conversation came across, how pleasant it was to hold, how much the participant felt at ease and how much they were inclined to give serious answers on a scale from 1 to 5. In the comparing part, the participants were asked their preference towards 1 of the demos when it comes to the graphical style and the feeling of being heard. This was asked on a scale from 1 to 5 with 1 and 5 being clear preferences towards one demo and 3 feeling neutral. They were then asked to elaborate on their answers.

4.1. Results

In the table below, the averages of the answers can be seen. More elaborate results including standard deviations and the participant's comments can be found in Appendix D.

Table 3: Result summary of the concept evaluation.

	Average of setup 1	Average of setup 2	Difference	Conclusion
Comes across as natural	2.875	2.75	0.125	Slightly in favour of 1
Conversation feels nice	3.125	3.125	0	No difference
Feeling comfortable	3.75	3.375	0.375	Slightly in favour of 1
Answering seriously	3.75	3.625	0.125	Slightly in favour of 1
	Average		**Difference**	**Conclusion**
Preference for feeling heard	3.375		-0.375	Slightly in favour of 2
Preference for graphic style	2.75		0.25	Slightly in favour of 1

The results show a slight preference towards set-up 1 with the drawn characters, but with little significance and often a high deviation. These statistical results show no clear preference towards one of the two set-ups, but in the elaboration and in the comments, the participants mostly showed affection towards set-up 2. However, they found that it still came across as unrealistic in the demo. The participants that preferred set-up 1 mentioned that this was because set-up 2 comes across as unnatural with the lifeless pictures of the coaches.

4.2. Conclusion

I believe that if the coaches in set-up 2 were portrayed more realistically, for example by taking one picture of all the coaches at the table instead of separate edited pictures put together, it will solve part of the problem. It might also help to have the coaches move slightly instead of sitting still. However, this is still speculation and the question still stays: if using pictures of real people in the setting of Council of Coaches would be perceived better then drawn coaches.

The lifelessness of the coaches will always stay when you do not use moving pictures. But unfortunately, using video fragments instead of pictures poses multiple problems. It will still be difficult to not come across as unrealistic. It is considered to have a video of an actor who either had text shown somewhere on the screen or to have him or her speak. However, in the first case, using real people in a room with written text will likely feel

unreal, because of the mix of realistic body language together with an unrealistic text element. But in the second case, using real speech as answers to the multiple-choice answers of the user would likely also come across as unnatural. It would be an improvement over written text, but a scripted reaction to a certain answer will not always fit the intention of the user. In a real conversation with someone, that person will be able to adapt their answer, body language and tone of voice to the intent of the other, but in a scripted conversation, this will be much harder as the intent of somebody would not be fully represented in the answers. Thus, it will likely not be feasible within the current scope of Council of Coaches.

The advantage of the sketched coaches is that people would be more forgiving towards them because the users will know that they are not real. Simple text balloons can be used instead of speech because it fits the style. Additionally, being able to use still images of sketches people also makes it easier to change and easily enables third parties to add new elements (Council of Coaches, 2019).

PHASE 5: FINAL DESIGN PROPOSAL

The results from the co-design and the concept evaluation were used in a parallel design process involving multiple iterations for the different features in the interface. In the following sections, the results of these iterations are shown.

5.1. Base interface design

Figure 15: interface concepts

The three pictures above all possess different variations within the character icons, the speech balloon and the overall layout of the text interface. In the first picture, the speech balloon contains the name and function of the coach to make this clear to the user, however, presented in this way it does not look very friendly. The dark background of the text interface makes a good contrast with the white text balloons but does give a negative feeling. Also, the long stretched out text looks strange. In the second picture, the character icons are placed in the bar on the top-right. It was examined if they were positioned better in middle or left or spread out over the bar, but this was not the case. The bar does seem to take up much of the top space and crops in the image of the coaches, which could not be desirable. In the text balloon, the function of the coach is left out and replaced with a picture of the coach. This would help the user understand who is talking if the coach would be out-of-frame, but does not add much additional information as the coach is visible. In the text interface, the black background is replaced with green as was suggested by the first group in the co-design. However, it quickly catches the eye and might take away the attention from the coaches. The text balloons are shortened to make them more readable and the previous and next buttons are placed more closely to each other to convey their meaning by proximity. In the third picture, the bar

for the character icons is left our creating more space on the screen while making the icons part of the interface. The picture of the coach in the text balloon is left out.

5.2. Functions

Muting a coach and asking for a conversation with a single coach where the two main functions that could be implemented in the interface. In both cases, it is important to ask the question of what would be the meaning of when the user uses these functions and what affordances can be used to show this.

It is still to be determined whether a coach still actively listens to the conversation after it is muted, if it passively listens or if muting it simulates asking it to leave the room, in which case it does not listen at all. The same applies to asking for a conversation alone with a single coach: whether the other coaches still hear the conversation or not. In the end, from a functional view, it comes down to the question if the coaches still take into account what is being said while they are muted or while the user is in a separated conversation with one coach.

This could then be shown to the user: if the coaches still listen, they could still be present in the image, but in a way that the user understands that they are still listening and the same principle applies for when the coaches are not listening.

5.2.1. Using a table as a realistic interface

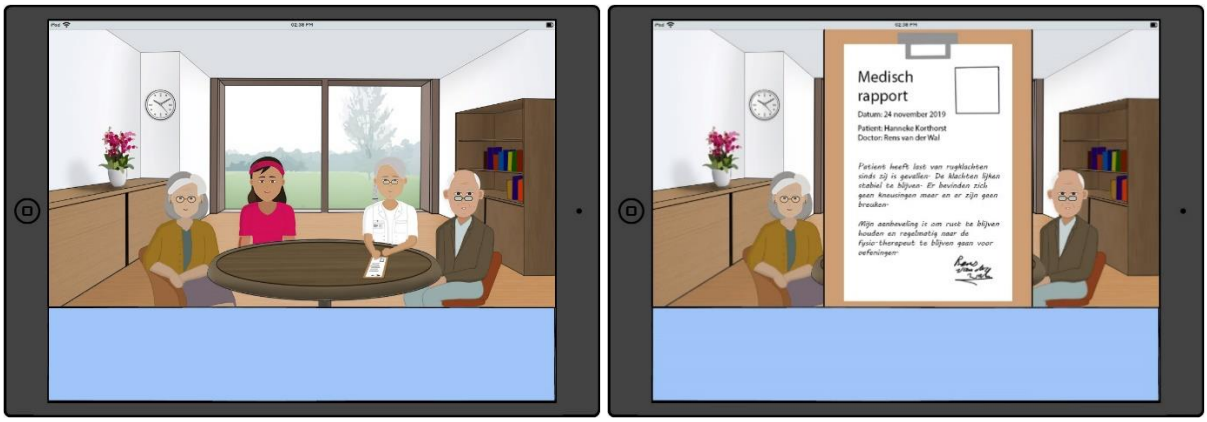


Figure 16: using the table as an interface

Before, the interaction with the coaches and to what was happening was mainly envisioned as pressing the text options in the text interface. However, existing objects in the room can be used to create more interaction between the user and the coaches without adding distracting elements. If the coaches would have things they want to show the user, such as a document they would like to discuss, they could put that on the table so that the user can click on it. The other way around, the user could click on the table if they want to show the coaches something.

5.2.2. Virtual interactions

Muting a coach

Figure 17: interface options for muting a coach

In the first, the mute icons are placed inside the coach icons, this takes up little space, but are small and could be difficult to press on a phone or tablet. In the second image, they are made bigger and placed underneath the icon, making them easier to press and also allowing for the icons to act as the button to talk to a coach alone. In the third picture, a single mute button is placed to the side of the coach icons to press when you want to mute a coach to then give the option to slick the coach you want to mute. However, this could be confusing for people with little experience with digital interfaces while not adding many benefits as opposed to the second picture.

When a coach is muted, that coach could fade out and stay semi-transparent as can be seen in the figure above or disappear entirely. Semi-transparency would indicate that the coach is still present and still hears the conversation and fading out would suggest that the coach is gone entirely until it is unmuted.

Conversation with a single coach

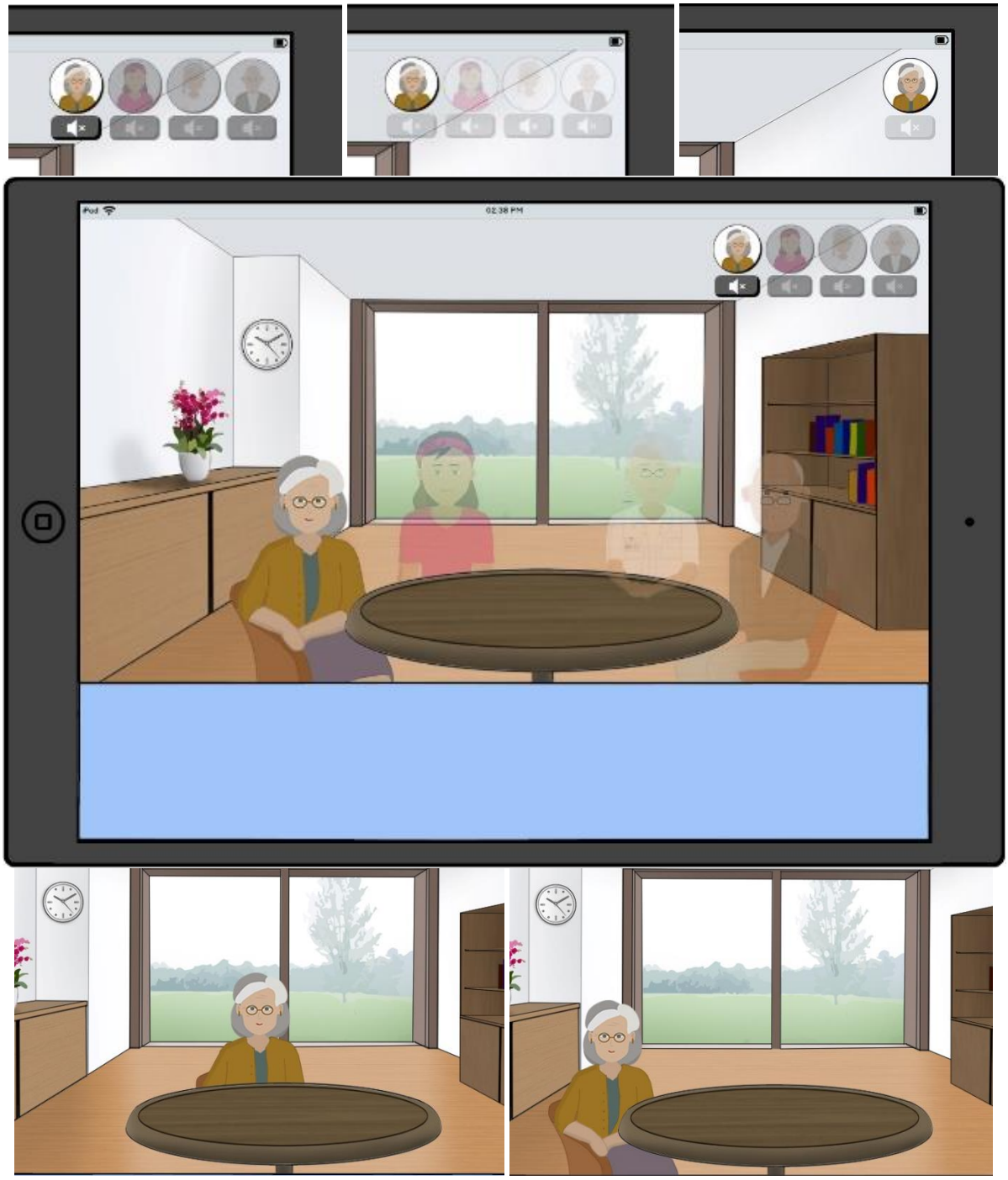


Figure 18: interface options for conversations with a single coach

In the first picture, the other three coaches are made semi-transparent, the same as would happen when they would all be muted. In the second picture, also the mute button is made transparent because muting this coach should not be intended when you are talking to that coach alone. This however still looks very similar to just muting the other coaches, therefore the other icons are completely removed in the third picture. Similar to the muted coaches, they could become transparent to convey that they are out of the conversation, but when they are not supposed to be present anymore, they could disappear entirely. As a possible addition, the coach that remains could move over opposite of the user to fill the space left by the other coaches.

5.2.3. Realistic interaction

Muting a coach/conversation with a single coach

In the pictures below, the coach has to be clicked, then the options will appear on screen to mute that coach or to ask for a single conversation. In the first two pictures, the coach is highlighted when it is clicked to make it clear which coach it is about. In the first picture, the text options are displayed above the coach to further emphasise this, however, this could be confused with the text balloons of the coach. In the second picture, these options are displayed in the text interface just like the other text options. The highlight does take away some sense of realism. Therefore, in the third picture, the highlight is removed and the name of the coach is added to the text options.

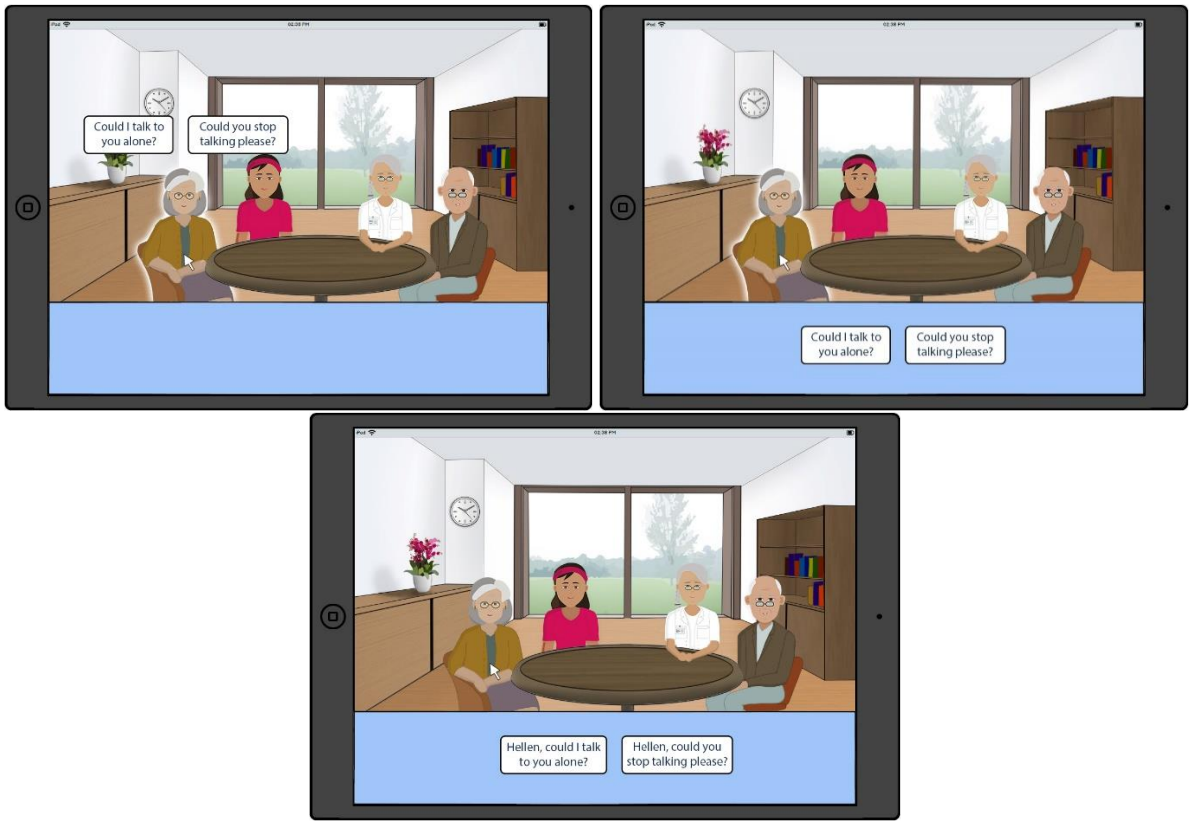


Figure 19: interface options for a realistic interaction

Muted coach

To mute a coach in a realistic way, it was thought of ways how people could look closed off. Things were considered such as crossing your arms and leaning back but also listening to music, reading a book or newspaper or looking at a phone. These would all communicate that people want to shut themselves off from the people around them when they are in a public space. They are displayed in figure 20. In the first picture, this is displayed by the coach reading a newspaper, which makes it clear that it is not participating in the conversation anymore. However, it is not clear if it is still hearing everything that is being said. In the second and third picture, the coach puts its hands in front of its mouth or crossing its arm, which would create a closed posture. This makes it clearer that the coach still hears the conversation but is not talking anymore. In the fourth and fifth picture, the coach stands up and leaves entirely, making it clear that is not participating or hearing anymore.

Figure 20: realistic metaphors for a muted coach

5.3 Functional prototype

From the elements mentioned in chapter 5.2, multiple options were selected and incorporated in a simple functional demonstrator. This was made as a simple slideshow in PowerPoint where buttons can be used for navigation. The elements that were selected for this demo can be seen in the morphological diagram in figure 21 and screenshots from the demo itself are shown in figure 22.

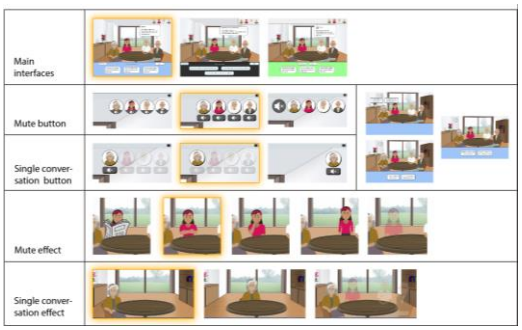
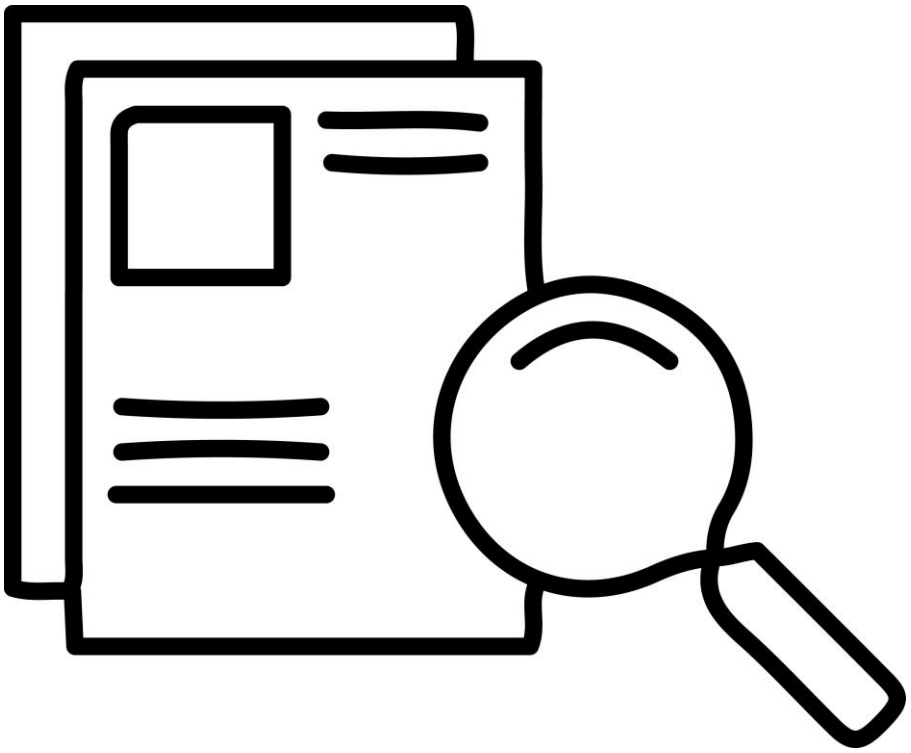


Figure 21: morphological diagram

Figure 22: screenshots from the functional prototype



CHAPTER III:

Reflections

This chapter takes the results from chapter II to reflect on them on what could have been done better or still could be done. Then, a conclusion will be drawn on the method used in this thesis and the final design and recommendations will be given on the implementations of the results from this thesis.

1. Discussion

The main question in this thesis was how the current design of Council of Coaches can be optimised concerning its style, coaching environment and the interactions design to create an example of how Council of Coaches can be personalised for its target group. It is difficult to assess the target group of Council of Coaches as a whole and was therefore divided into smaller segments. For this thesis, this divide was made concerning the impairment of the user and focusses on older adults with ARI due to practical reasons. However, a much finer segmentation could be desirable for Council of Coaches. Possible variants of this could be impairment-related, such as specific kinds of problems or treatments that the person is following; context-related, looking at where the person is living: alone, together with somebody or in an elderly home; but also personal factors such as generation or even personality traits. Such specific segmentations, however, can quickly result in the need for many small variations of the design where many different users have to be involved in the design process. A more general segmentation, such as one used in this thesis, could be desirable if the time and resources for this are unavailable.

1.1. Interviews and co-design

From the interviews resulted that older adults could be subdivided into four smaller segments: almost or just retired adults, elderly people living together in their own home, elderly living alone in their own home and elderly people living in an elderly home. The co-design sessions were done with people from between 60 and 70 years old, falling in the category of almost or just retired adults. In brainstorms, different functions and coaches mentioned in the interviews were discussed together with different styles for the interface and possible interaction metaphors to create a design for their user segment together with recommendations for the other three segments within older adults. In the end, three concepts were made with paper prototypes of their interface. Additional functions that were found in the interviews and co-design were the ability to choose your own coaches, references to trusted forums and websites, a system that measures your progress towards a goal, a chat function to talk to peers or actual specialists and a call or interest group.

Beforehand it was suspected that, for older adults, the design of Council of Coaches would be too informal and too much centred around fun instead of the functionality. However, during these co-design sessions, it was discovered that for the participants, this was less about the perceived functionality and more about the feeling of being taken seriously. They could not relate to the current cartoon style of Council of Coaches for this reason. This cartoon style was meant to clearly convey the personalities of the coaches and thereby creating an understanding with the user, but the participants perceived this as not being taken seriously. Regarding the interactions between coaches, but also between the coaches and the user, the participants preferred minimal exaggeration and less distracting features and the same was true for the environment. In the final concept, a calmer, but still interesting environment was used. Keeping the home environment but putting the coaches all behind one table, going back to an older concept of Council of Coaches, which gives a more serious feeling. By putting the coaches around the table instead of behind it as well as using a “home” environment, should help to get rid of the too informal “you versus them” feeling, which was

Figure 23: coaching environment

the problem with the old concept. The final coaching environment is shown in figure 23.

Concerning the interactions, the main issues were again that the users would want to be taken seriously, but also with familiar human-like interactions. In the co-design, this was interpreted as that real people should be used in the app in a very realistic style. Therefore, images of real people replaced the cartoon characters in the final concepts of the co-design sessions. The issue, however, as was found in the concept evaluation, was that these would quickly look fake because a *real* style would raise the expectancy of *real* reactions which could not be delivered. They were therefore replaced by the more realistically drawn style, as this would lower the expectations for their reactions while still conveying the feeling of being taken seriously. The main thing to keep in mind for the environment was that it should not become too distracting and should keep the focus on the conversation to indicate that the user is being taken seriously. Therefore, the conversation at the table is used instead of the setting where the coaches stand in their own area in a room.

1.2. Method

The method for user-centred design used in this thesis delivers a thorough understanding of the user segments that are involved in the process, which results in an interaction design that is tailored to these specific kinds of people. However, this approach is hardly scalable. The interviews and co-design are time intensive if they have to be done for all user segments. In this report, the co-design was done with older adults in the category of almost or just retired adults. The results of these sessions might not all translate to the other segments of older adults or the segments within users with CP or DM2. These are different people with very different problems and their activities, contexts and technologies all vary from each other. Looking only at older adults, the principle that they want to be taken seriously when it comes to their health would be translatable. However, if this would reflect in the style or main interaction metaphor that would fit them best cannot be said with certainty. Functions such as private conversations with one coach and the ability to mute a single coach or being able to read back what was said previously could be generic, but should be addressed in later research with these user groups. Concerning the functions, it has not been evaluated yet if older adults would prefer the virtual or realistic interactions, however, there would be pros and cons to both options. Concerning the muting function or having a conversation with a single coach, it should also be evaluated if the users would desire the muted coaches to be completely gone and not receive anything that is being said. However, this could be determined by very personal preference so explicit further research for this would be needed. The segmentation of older adults was mainly based on the interviews, which were done with only seven people. Then, the co-design sessions were only done with four participants. These are too little participants to make definitive conclusions about this target group but can give a good starting indication. This thesis was meant as a proposal for the current design of Council of Coaches. A larger group of users from this segment should still evaluate the final design in this thesis before it should be implemented.

1.3. Scalability

As mentioned in the *method*, the approach in this thesis is hardly scalable. To expand this approach to other segments, we need to take into account available resources such as the time it can take to develop each version for these segments. If later on, third party innovators can add new segments, they should also be able to make a proper design for their segment with the resources that they have. Therefore, a framework could be set up for making new variations of the design where the users can quickly be involved without taking much time. Early testing with the intended user

segment is essential in this to avoid designs that do not connect with their intended users. An idea for such a framework could involve a system where the new developers fill in a list of checkboxes giving them directions for the requirements of their design. Then from a tree-like structure of all the already existing segments, taking inspiration from the phylogenetic tree structure described by Li et al. (2015) where design features are clustered in an interactive visual way together with algorithmic suggestions for new visualisations (Li et al., 2015). There, the innovators could search for other similar segments and build on the knowledge of those segments. After this, a quick check can be done with the users where they can be shown quick ideas or a low fidelity prototype and evaluate these for a final design. A simple guideline for this could be the method described in interaction prototyping and evaluation (2019) in the Delft Design Guide, which describes four simple steps in which such prototypes can quickly be made and evaluated. This includes making a rough interaction prototype from a quick scenario sketch, which can be tested and evaluated by users. The advantage of this is that it can be done faster, however, it puts the participants in the role of the creator only much later in the process and puts more emphasis on merely evaluating the concept rather than creating it.

2. Conclusion

This thesis presented an example of a personalized interface for a segment of the target group of Council of Coaches using principles of co-design. An example of the division the target group of older adults would be the following four segments: almost or just retired adults; elderly people living together in their own home; alone or sick elderly living in their own home; and elderly people living in an elderly home, however, in the end, a much finer segmentation would be desirable. For almost or just retired adults, the main criteria to keep in mind is that the users want to have the feeling that they are taken seriously. In the current design of Council of Coaches, the cartoon style is meant to convey the personalities of the coaches and thereby creating an understanding with the user, however, this can come across as too informal. A balance needs to be struck between these two criteria. This balance is proposed by replacing the cartoon style by a more realistically drawn style and putting the coaches in a still interesting but less distracting environment.

This thesis functions as a check on the current design of Council of Coaches if it fits with the target group of older adults, in this case, specifically almost or just retired adults. This research is done with too little participants to give a definitive answer, but the results do suggest that there is a need to revisit the design concerning the style and main interaction metaphor. The results from this thesis can be used as a suggested solution for this problem but do need further evaluation.

3. Recommendations

There are still some issues remaining after this thesis, all of which are mentioned and elaborated in discussion. Also, certain recommendation came forth after the co-design sessions. The points are mentioned below:

- **Other functions** that were found in the interviews and co-design were the ability to choose your own coaches, references to trusted forums and websites, a system that measures your progress towards a goal, a chat function to talk to peers or actual specialists and a call or interest group.
- **Segmentation:** In this thesis, a very broad segmentation was implemented and later refined. However, for Council of Coaches a much finer segmentation could be desirable. If the

resources are available, such a fine segmentation can be considered, but if this is not the case, a broader segmentation, comparable to what is used in this thesis, could be implemented.

- **Scalability:** the method in this thesis is not scalable. If the target group were to be finely segmented, a framework should be made to aid the design for new segments. An example of this could be a list of checkboxes linked to a tree structure of the designs for already existing segments. Here, the innovators can build on already existing knowledge to create a concept where the user can be involved according to the TU Delft guidelines of interaction prototyping and evaluation (2019).
- **Evaluation:** As mentioned in the discussion, the final design was not evaluated again with users. If this were to be implemented, a proper evaluation is necessary. Here it would be necessary to look at how the coaching environment is perceived by the user and if the functions described in phase 5 are perceived positively and are explicit enough. Then the choice needs to be made if the virtual or realistic ways of interacting will be implemented.

4. References

4.1. Council of Coaches references

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Appendices

Appendix A: Informed consent forms

Toestemmingsformulier

Projectnaam: Council of Coaches

Onderzoek: Interviews voor gebruikersonderzoek van Council of Coaches

Hierbij verklaar ik dat ik goed geïnformeerd ben over de doelen en methodes van dit onderzoek. Al mijn vragen zijn beantwoord en ik heb genoeg tijd gehad om de beslissing te maken om mee te doen.

Uw keuze om mee te doen is helemaal vrijwillig. Als u meedoet, kunt u zich altijd bedenken en toch stoppen zonder een reden aan te hoeven geven. Ook tijdens het interview.

U bent zich ervan bewust dat de vragen die gesteld worden gaan over uzelf: uw hobby's, interesses en uw dagelijks leven en hoe u bezig bent met uw gezondheid.

Ik ga ermee akkoord dat mijn informatie gebruikt wordt voor het project Council of Coaches, zolang dit op een vertrouwelijke manier gebeurd: De interviews zullen worden opgenomen met een geluidsopname, die later op een beveiligde plek zal worden opgeslagen. Deze opname wordt alleen gebruikt om af te spelen wat gezegd is tijdens het interview en zal na het project vernietigd worden. Tijdens dit onderzoek wordt uw data en wat u zegt geanonimiseerd worden. Het wordt geanalyseerd op een manier dat het niet meer naar u terug te leiden is.

☐ Ik wil mee doen aan het boven genoemde onderzoek

Naam :		Naam :	Casper Kroon
Plaats :		Plaats :	Enschede
Email :		Email:	ckroon@rrd.nl
Datum:		Datum:	
Handtekening deelnemer:		Handtekening onderzoeker:	

Toestemmingsformulier

Projectnaam: Council of Coaches

Onderzoek: Co-design voor Council of Coaches

Hierbij verklaar ik dat ik goed geïnformeerd ben over de doelen en methodes van dit onderzoek. Al mijn vragen zijn beantwoord en ik heb genoeg tijd gehad om de beslissing te maken om mee te doen.

Uw keuze om mee te doen is helemaal vrijwillig. Als u meedoet, kunt u zich altijd bedenken en toch stoppen zonder een reden aan te hoeven geven. Ook tijdens de co-design sessies.

Ik ga ermee akkoord dat de informatie die ik geef gebruikt wordt voor het project Council of Coaches, zolang dit op een vertrouwelijke manier gebeurd. De interviews zullen worden opgenomen met een geluidsopname, die later op een beveiligde plek zal worden opgeslagen. Deze opname wordt alleen gebruikt om af te spelen wat gezegd is tijdens het interview en zal na het project vernietigd worden. Tijdens dit onderzoek wordt uw data en wat u zegt geanonimiseerd. Het wordt geanalyseerd op een manier dat het niet meer naar u terug te leiden is.

☐ Ik wil mee doen aan het boven genoemde onderzoek

Naam :		Naam :	Casper Kroon
Plaats :		Plaats :	Enschede
Email :		Email:	ckroon@rrd.nl
Datum:		Datum:	
Handtekening deelnemer:		Handtekening onderzoeker:	

Appendix B: Interview questions

Doelen:

1. Wat voor een persoon is hij/zij? (personal)
    a. Bijvoorbeeld: Fysiek, sensorisch, motorisch mogelijkheden/beperkingen.
    b. Cognitief, opleiding, type denker, cognitief niveau.
    c. Sociaal-emotioneel (karakter, manier van omgaan met levensgebeurtenissen, situaties, interacties met anderen)
    d. Cultureel: wat voor subgroep/ archetype (hardrocker, tech-student, kunstenaar etc)
    e. Dromen, wensen, ambities, motivaties, interesses
    f. Grondwaarden: waar sta je voor waar geloof je in vanuit welke basiswaarden leef je.
    g. Big five:
        i. Zorgvuldigheid
        ii. Intro-/extravert
        iii. Snel emotioneel (Eerste instantie: eerder snel/emotioneel denken of meer zorgvuldig of rationeel denken)
        iv. Openheid voor nieuwe dingen
        v. Instemmingsgeneigdheid
2. Maakt hij/zij vaak gebruik van digitale media (computers, smartphones, tablets)?
    a. Zou de persoon dat meer willen?
3. Wat zijn andere producten die hij/zij vaak gebruikt?
4. Hoe goed is de persoons kortetermijngeheugen
5. Hoe vaak ziet de persoon andere mensen?
6. In hoeverre heeft de persoon last van ‘age related impairments’?
7. Wat zijn de gevolgen hiervan op die persoons leven?
8. Wat zou hiervan van invloed kunnen zijn op COUCH en hoe?
9. Hoe voelt de persoon zich hierbij

Vragen:

1. Wat is uw woonsituatie
2. Kunt u wat vertellen over uw hobby’s/ dagelijkse bezigheden?
3. Maakt u vaak gebruik van digitale producten zoals een computer, smartphone of tablet?
4. Heeft u vaak bezoek, gaat u vaak op bezoek bij andere mensen
    - Als u met anderen bent, bent u dan erg spraakzaam?
    - Hoe is dit als u met vreemden bent?
5. Ziet u vaak uw familie/vrienden?
6. Zijn er dingen die u nu niet meer kunt, maar vroeger wel graag deed?
7. Zijn er dingen die u nu juist wel kunt, die u vroeger niet/moeilijk kon doen?
8. Ervaart u “last” van ouder worden?
    - Op fysiek gebied
    - Op sociaal gebied
    - Op cognitief/mentaal gebied
9. Wat zou u doen in de volgende paar situaties?
    - Eind van een lange dag als u thuiskomt
    - Wanneer u even niks hoeft te doen en wat voor uzelf kunt doen
    - Als iets niet lukt en als u even iets anders moet doen

10. Welke positieve aspecten van het ouder worden kunt u over vertellen?
11. “Ik ben bezig met een onderzoek voor een app dat digitale ondersteuning geeft voor ouderen met gezondheidsproblemen en probeer een zo goed mogelijk beeld te scheppen van deze doelgroep.” Heeft u daar ideeën over?
12. Is er nog iets anders dat u graag aan mij kwijt zou willen?

Appendix C: Comments about Council of Coaches from the interviewees

Interview 1	Deelnemer 1	Deelnemer 2
Gebruik van COUCH	▪ Liefst op de tablet, want groter is wat fijner	▪
Ideeën voor COUCH	▪ Klankboord ▪ Praten met mensen die hetzelfde probleem hebben ▪ Verwijzingen naar betrouwbare sites/fora ▪ In persoonlijk contact komen met lotgenoten	▪ Hij krijgt nergens concreet antwoord. Praten met lotgenoten, verhalen van anderen/adviezen zou fijn zijn in een klankboord idee. ▪ Als hij een vraag stelt aan een specialist, heeft hij niet meteen antwoord nodig, maar als dat na een uur/half uurtje kan is dat ook prima. Nu kom je thuis na een gesprek en bedenk je weer nieuwe vragen of ben je weer dingen vergeten. ▪ Chat functie, vraag/antwoord ▪ Verwijzingen naar betrouwbare sites om het "Kaf van het koren te scheiden" ▪ Adviezen ▪ Database van vragen die andere mensen gesteld hebben, ervaringen van anderen

Interview 2	Deelnemer 1	Deelnemer 2
Gebruik van COUCH	▪ Oefeningen die men kan doen ook al ben je ver weg. ▪ Zal het liever op de bank gebruiken. In een ontspannende setting ▪ Zal het liefst privé gebruiken, niet als de echtgenoot erbij is.	▪ Bij hele concrete vragen als hij informatie wil. ▪ Ontspannen setting of aan tafel zou voor hem niet veel uitmaken. Hij werkt sws veel aan tafel, maar isoleert zich liever wegens concentratie ▪ Groter scherm is prettiger met eventueel een koptelefoon.
Ideeën voor COUCH	▪ Vrij aanspreken met tekst of spraak, geen keuzes. Maar als dit niet goed werkt zal dit frustrerend zijn. ▪ Pijn scores opgeven in een app, dat je zelf kunt zien of de pijn verminderd na een bepaalde tijd. In zo'n systeem als COUCH zal dat wel passen	▪
Opmerkingen over COUCH:	▪ Voor haar is het erg vervelend als ze veel moeite moet doen om ergens een afspraak te maken, door het invullen van vragen over	▪ Je kunt dingen opzoeken op internet maar wat heb je daar precies aan. Je hebt iemand nodig die tegen je zegt van dat

	de klacht, en ze te horen krijgt dat het beter is daar geen afspraak voor te maken. Haar mening is dat mensen veel te veel weg gehouden worden van de huisarts die het al druk genoeg hebben. ▪ Vreest dat COUCH niet goed kan helpen bij erg specifieke problemen en niet de plek in kan nemen van deskundigen ▪ De motivatie zou zinvol zijn. Het zou makkelijk zijn om het programma een keer te gebruiken en daarna niet meer, dus motivatie zal erg belangrijk zijn.	en dat en wat de oorzaak kan zijn. Dan zal je altijd verschillende mensen hebben die daar iets anders over zeggen. Maar daar moet je nu zelf op een manier een weg in vinden. Daar zou het wel handig voor zijn als een systeem je een tijdje volgt die je stimuleert goed bij te houden hoe het met de pijn zit en waar experts zich over buigen.

Interview 3	Deelnemer 1	Deelnemer 2
Ideeën voor COUCH	▪ Voor ouderen van hun leeftijd zou er heel goed rekening gehouden moeten worden met dat mensen nog geen ervaring hebben met digitale producten of dat ze die niet eens hebben. “Er zullen genoeg mensen zijn die geen computer hebben”. ▪ Achter een antwoord van een computer zit geen emotie. Voor mensen die alleen zijn is emotie heel erg belangrijk om de warmte van een persoon te hebben. ▪ Een blikken geluid zal zij geen empathie hebben. “Er moet emotie achter zitten en dat heb ik niet bij een blikken stem”. Een echt contact vind zij essentieel. ▪ Als zij ziek zou zijn en helemaal alleen zou ze het fijn vinden om elke morgen gebeld te worden hoe het met haar gaat. ▪ Mantelzorg zou gelinkt kunnen worden met de app. Dat wanneer zij aangeeft dat ze iets nodig heeft, meteen de mantelzorger bericht krijgt. ▪ Ze vind het wel beangstigend dat je heel veel informatie geeft aan het programma. ▪ Ze zou het wel fijn vinden om, als ze alleen zou zijn en erg ziek is, een gesprek te kunnen hebben of opgebeld te worden vanuit de	▪ Zou het fijn vinden om informatie te kunnen vinden over specifieke situaties. Hijzelf kan dat nu nog wel opzoeken, maar kent genoeg ouderen die daar problemen mee hebben. ▪ Hij had laatst een artikel gelezen over een app voor ouderen die leek op COUCH, maar dan met echte mensen. ▪ Zijn eerste reactie op dat via de app gepraat zal worden met tekst ballonnen is dat “mensen daar niet op zitten te wachten”. Hij wil het gevoel hebben van een echt persoon dat voor hem staat. ▪ Typen zou volgends hem onhandig zijn.

	andere kant. Of en reminder of ze de medicatie al genomen heeft. Mits een echt persoon niet langs kan komen. ▪ Informatie adressen zouden erg hulpzaak zijn: thuiszorg, politie, arts. Ze zou willen dat ze vanuit de app zou kunnen bellen, of doorgeschakeld zou kunnen worden, naar deze hulpdiensten. Nu zijn ze nog in staat om zelf te bellen als er iets mis is, maar andere mensen zullen dat niet meer zijn. ▪ Heel veel mensen zijn bang. Bang dat mensen in zullen breken of dingen zullen stelen. Sommige mensen maken zich hier heel veel zorgen om.	

Interview 4	Deelnemer 1
Ideeën voor COUCH	▪

Appendix D: Results from concept evaluation

Set-up 1

	In hoeverre kwam het gesprek als natuurlijk op u over?	Vond u het gesprek fijn om te voeren?	Hoe erg voelde u zich op uw gemak tijdens het gesprek?	In hoeverre was u geneigd om serieuze antwoorden te geven?
N	8	8	8	8
Average	2.875	3.125	3.75	3.75
Standard deviation	1.125991626	0.6408699445	0.8864052604	1.281739889

Set-up 2

	In hoeverre kwam het gesprek als natuurlijk op u over?	Vond u het gesprek fijn om te voeren?	Hoe erg voelde u zich op uw gemak tijdens het gesprek?	In hoeverre was u geneigd om serieuze antwoorden te geven?
N	8	8	8	8
Average	2.75	3.125	3.375	3.625
Standard deviation	1.035098339	0.8345229604	1.060660172	1.060660172

Mixed

	Heeft u een voorkeur voor een van de set-ups wanneer het gaat om het gevoel dat u zich gehoord voelt?	Heeft u een voorkeur voor een van de set-ups als het gaat om de grafische stijl?
N	8	8
Average	3.375	2.75
Standard deviation	1.302470181	1.488047618

Comments:

Participant 1 (1-20 y): De eerste setup geeft meer het gevoel alsof het een serieus programma is dat informatie geeft terwijl de tweede setup te onnatuurlijk overkomt door de levenloze foto's van mensen.

Participant 2 (20-35 y): Lichte voorkeur voor 1 omdat de stock-images van 2 niet heel realistisch over komen, als het foto's zouden zijn van echte dokters zou het wel goed zijn.

Participant 3 (1-20 y): Set up 2 komt serieuzer over, professioneler ook. Voor doelgroep (50+?) is 2 denk ik beter, maar stel dat de doelgroep jonger is werkt setup 1 misschien beter.

Participant 4 (35-55 y): Is realistischer door andere setting en ‘echte’ mensen. De tekstwolkjes staan nu niet op de juiste plaats, wellicht logisch voor de demo maar ik vind het wel erg afleiden.

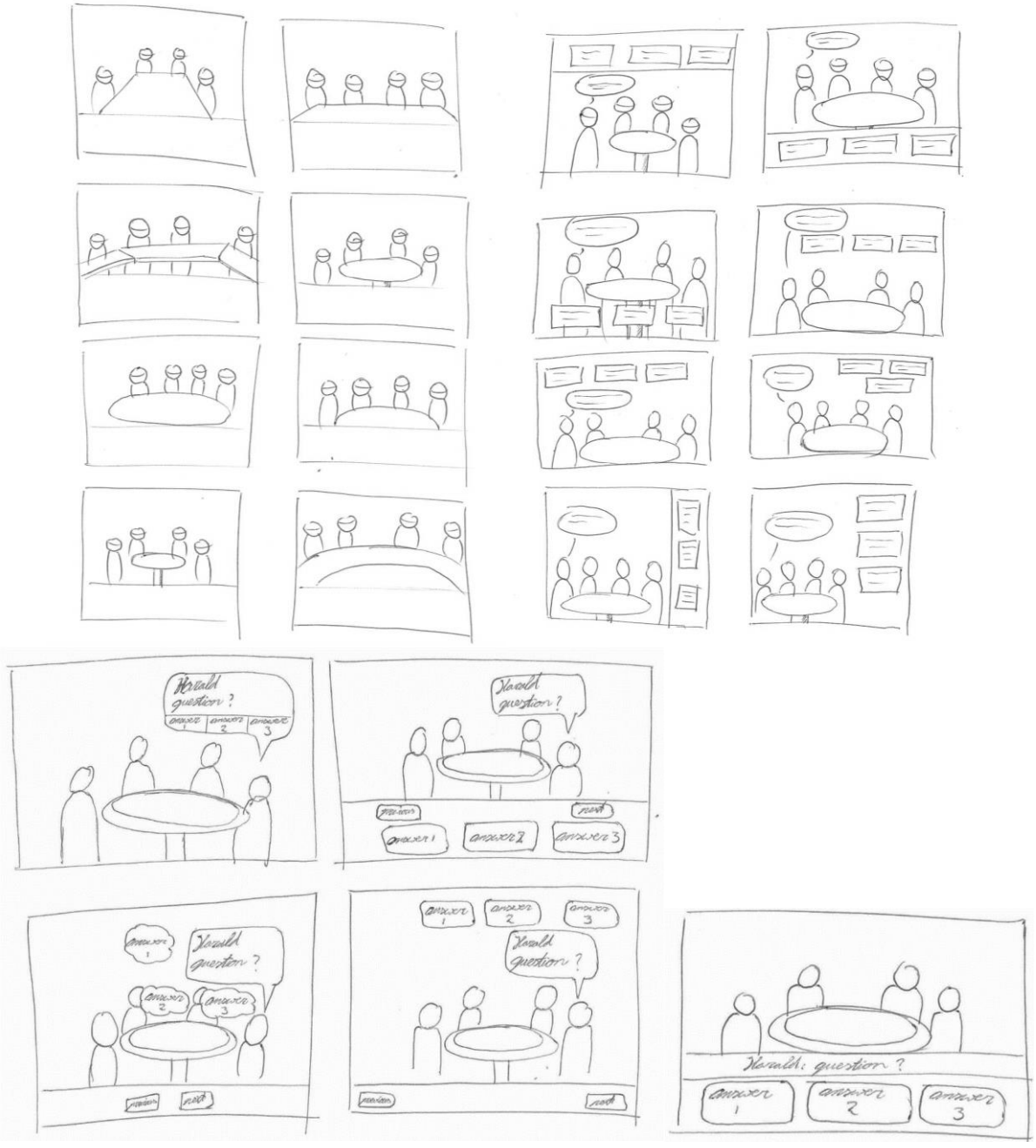
Participant 5 (20-35 y): Setup 2 komt serieuzer over, maar ziet er heel nep uit. De grafische stijl van setup 1 is consistenter maar niet heel professioneel.

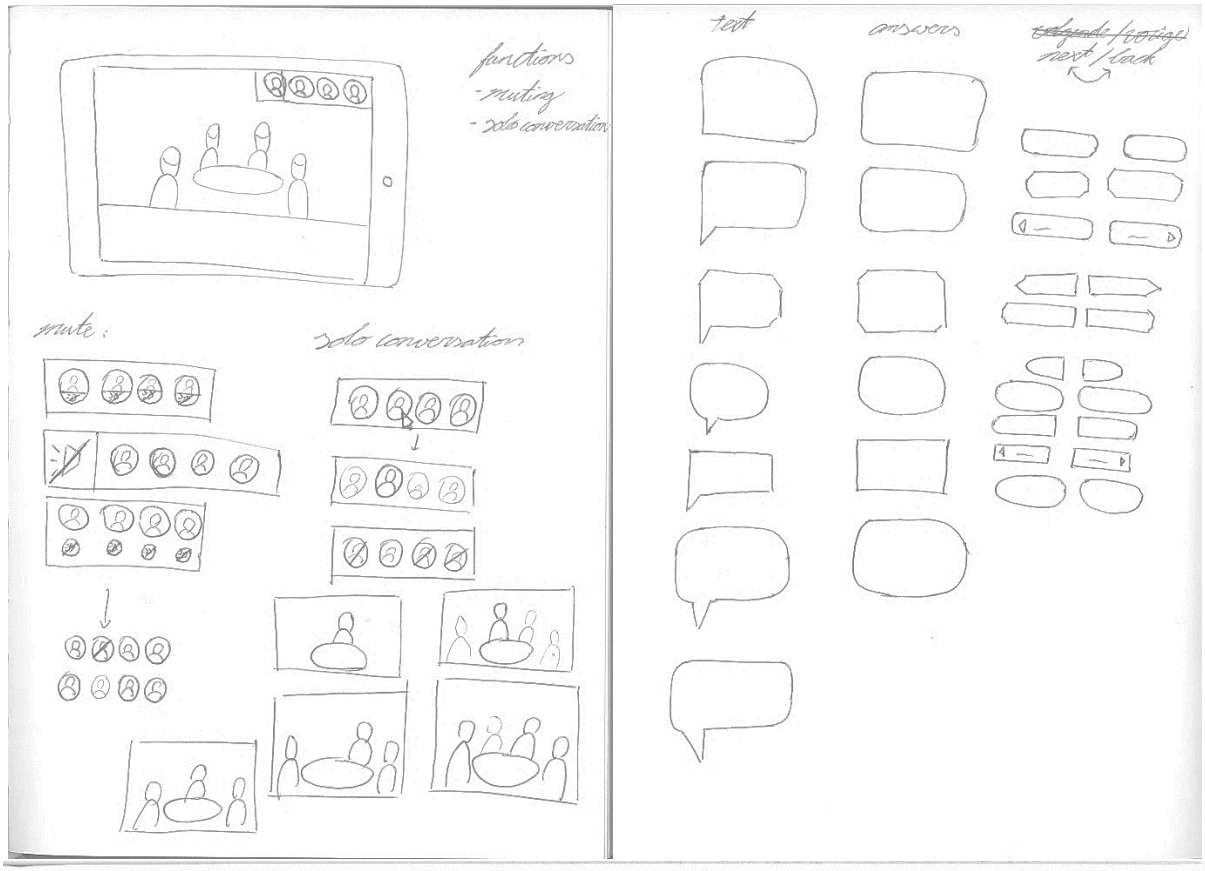
Participant 6 (55-70 y): Bij set-up 2 is er een aparte mix tussen realiteit en toch het gegeven dat het een app is, terwijl set-up 1 duidelijk een digitale situatie is. Op een of andere manier is dat passender. Leuk ook dat alle ervaringsdeskundigen in één ruimte zitten.

Participant 7 (55-70 y): Set-up 2 komt serieuzer over. Voorbeeld is nog vrij summier om een goed beeld en gevoel erbij te krijgen.

Participant 8 (55-70 y):

Appendix E: Ideations

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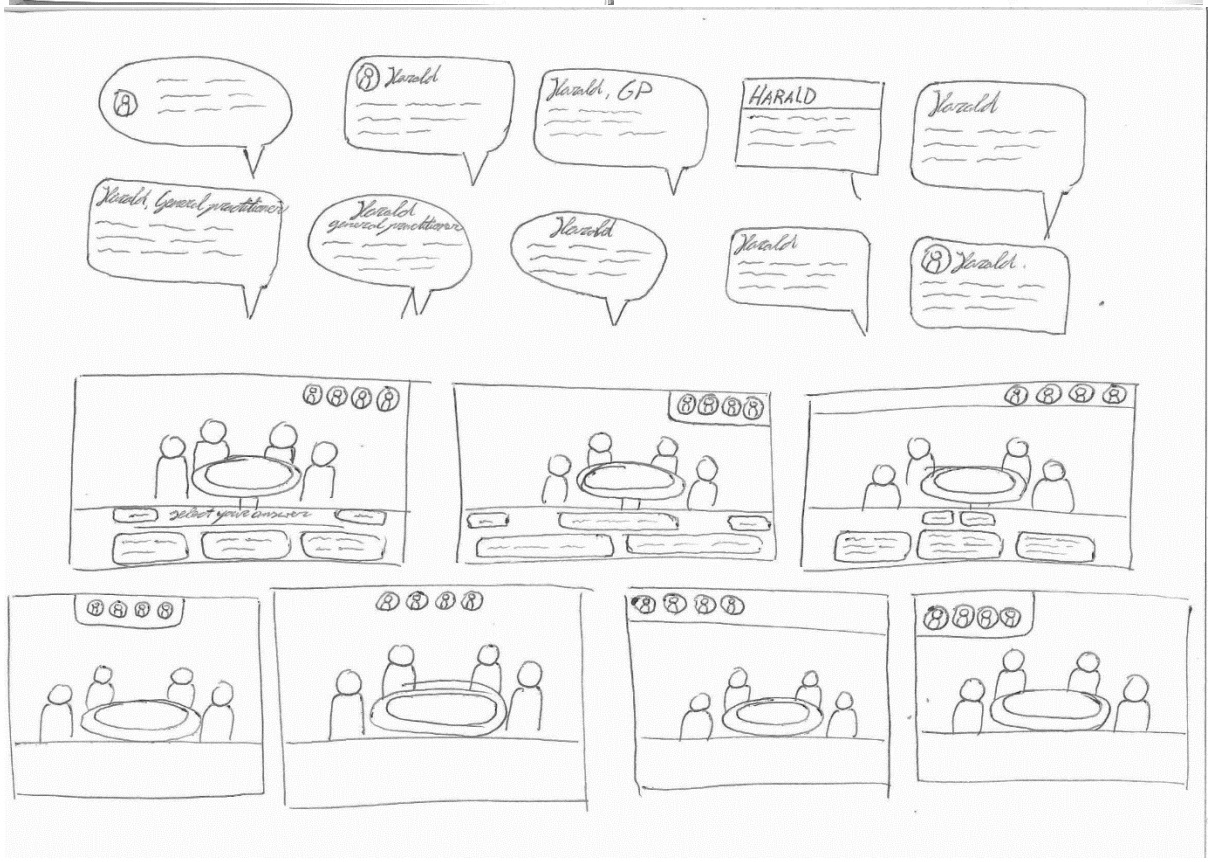
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