PeerRadio and PeerLight

Supporting elderly people in experiencing social moments from home

Franziska Tachtler

May 2015

Thesis-project – Interaction Design Master at K3

Malmö University, Sweden
Date of Examination: May 27, 2015

Franziska Tachtler
Interaction Design (M.Sc.)
info@franziskatachtler.com

Supervisor:
Pelle Ehn
Malmö University
pelle.ehn@mah.se

Examiner:
Kristina Lindström
Malmö University
kristina.lindstrom@mah.se
Abstract

Some elderly people with deteriorating abilities who receive home care service and do not use new technologies miss social content in their everyday lives. In my thesis, I research which role technology can play for these home care receivers in experiencing culture and how social interaction with peers from the same urban neighborhood can be embedded in this cultural experience. Based on my findings, I defined culture as little special moments in everyday life which change the perception of a day positively. Outgoing from fieldwork and literary research, I developed two scenario-based designs, PeerRadio and PeerLight, with the aim to create these moments at home in the elderly people’s everyday lives. PeerRadio is a radio program for home care receivers from the same neighborhood which sends contributions made by the elderly people themselves and gives them a reason to talk to each other. PeerLight is a connected lamp which makes the user’s activity visible at a peer’s home and vice versa and thereby supports caring for each other. Finally, my thesis clarifies how these concepts are answers to the named research questions and how they should be developed further in future works.
1 Introduction .............................................................................................................. 5
2 Related Interaction Design works ......................................................................... 6
3 Research methods .................................................................................................. 10
   3.1 Fieldwork: interviews ...................................................................................... 10
   3.2 Ethnographic approaches ................................................................................ 10
   3.3 Revised methods: literary research & scenario-based design ......................... 12
4 Exploration ............................................................................................................. 13
   4.1 Fieldwork: the problem domain ...................................................................... 13
       4.1.1 Identify possible activities ...................................................................... 13
       4.1.2 Criteria for activities ............................................................................. 15
       4.1.3 Home care receivers’ social lives ......................................................... 17
   4.2 Ethnographic research: collaborating with elderly people ......................... 18
   4.3 Literary research: the user group ................................................................. 20
       4.3.1 Meaningful relationships .................................................................... 21
       4.3.2 Different perceptions of support ............................................................ 21
       4.3.3 Home care receivers’ activities ............................................................. 24
       4.3.4 Used technologies and communication media ..................................... 25
5 Design process ....................................................................................................... 26
   5.1 Personas and their everyday lives ................................................................. 26
   5.2 The concepts PeerRadio and PeerLight ....................................................... 29
   5.3 Scenario-based design ................................................................................... 30
       5.3.1 Scenarios for the concept PeerRadio ................................................... 30
       5.3.2 Scenarios for the concept PeerLight ..................................................... 40
   5.4 Final concepts ............................................................................................... 44
6 Conclusion ............................................................................................................ 48
   6.1 Discussion ...................................................................................................... 48
   6.2 Future work .................................................................................................. 51
References .................................................................................................................. 53
List of Figures ............................................................................................................. 59
1 Introduction

Elderly people are often scared of being inconvenient or disturbing when they try to get in contact with others. Additionally, they need a reason to go out and take part in the urban life. But if they do not go out, they can become prisoners in their own homes (I’DGO, 2012). Especially in highly connected cities, disconnection is a serious problem. For example in Hong Kong the suicide rate among elderly people is increasing (Yip, 2011). Developments such as Smart Homes but also changing family structures exacerbate the situation (Harley, 2006; McCarthy & Thomas, 2004). Even the small forms of social contacts such as other elderly people living in the elderly care center or the employees of the center disappear. Because of economical reasons (Harley, 2006) and the growing number of elderly persons (United Nations, Department of Economic and Social Affairs, Population Division, 2013), the isolation of people living in smart homes will be an issue, which we have to face now and in the future.

For younger people, networking happens to a great extent by the use of digital tools. That most seniors need help to learn how to use new technologies (Smith, 2014) indicates that these new technologies are maybe not designed for elderly people. Not being online or knowing how to use these tools is disabling elderly people from networking through that medium. In the area of interaction design it is an interesting challenge to find a solution for this problem by using technology which pursues the goal to make people feel young not old (Subasi, Malmborg, Fitzpatrick & Östlund, 2014).

In urban environments cultural activities are a way for gathering. Additionally, experiencing culture makes the elderly people’s lives meaningful or enjoyable. In the so called Skånemodellen culture is defined to be part of the elderly care just like food and medicine (Kulturrådet, 2012), and region Skåne’s cultural administration Kultur Skåne has developed a regional culture plan in which one of the target groups are elderly people (Kultur Skåne, 2012). In urban environments, there are a wide variety of cultural activities. According to the Swedish government, everybody has the right to enjoy cultural activities under the same conditions (Government Offices of Sweden, Ministry of Culture, 2011). Especially for elderly people who have difficulties to leave their homes, it is challenging to take part in social activities. Therefore, the focus of my thesis is elderly people with deteriorating abilities who receive home care service and who do not use
new technologies. I examine their social life and how it can be improved by an Interaction Design concept. The overall idea of my thesis is that a cultural moment in their everyday life could be a reason for them to get in contact with peers who live in close proximity to them. As the term culture is wide, I narrow it down alongside my research. My research questions are: Which role can technology play for these elderly people in experiencing culture? Is it possible to embed social interaction with peers from the same urban neighborhood in this cultural experience?

To explore these questions, I first position my work in the context of other Interaction Design projects and summarize what I have learned from their outcomes. After this, I explain the methods I wanted to use in my studies. In the following chapter, I depict how I have carried out these methods. Unfortunately, some problems came up during my research, so I have had to change my way of working. After summarizing the outcomes of my literally research about the user group, I introduce the design process and the final concept. In the conclusion, I come back to the research questions, discuss my work and give an outlook on possible future works.

2 Related Interaction Design works

In the field of Human-Computer-Interaction (HCI), ageing has become an important issue since 2007 (Vines, Pritchard, Wright, Olivier & Brittain, 2015). Also in Interaction Design, the ageing of society is a reason for different kinds of research projects. In the following chapter, I introduce Interaction Design projects about elderly people’s social lives embedded in their everyday lives. As I focus on elderly people receiving home care service in my thesis, I chose Interaction Design projects with elderly persons living at home as the potential user group. Additionally, the aim of the selected projects is to encourage social interaction between peers living in the same neighborhood. In most of the examples, networking happens with the help of activities.

For instance, the IT University of Copenhagen developed the concept of a *Ticket-to-talk-television*. Starting point for the project was Sacks’ (2010) statement that everyday activities such as going on a walk legitimate starting a conversation; they become so called *tickets-to-talk*. Consequently, people who are feeling lonely do not need to expose their need for social interaction. The researchers of the IT University of Copenhagen tried to find ways how watching TV could function as a *ticket-to-talk* and thereby
support social interaction in the local neighborhood community (Svensson & Sokoler, 2008). They redesigned a technology, namely a TV remote control, which is familiar to elderly people. Outgoing from existing TV remote controls, they developed a presence remote (PR), which has additional functions such as seeing which of the peers is watching TV and having the PR mode activated. The elderly people have a free choice to turn the PR mode on and thereby be available or not. Via their cell phones, they can get in contact with a peer (Svensson et al., 2008). The examined group of seniors could imagine the PR as a digital version of a ticket-to-talk which can transport the feeling of “belonging and connectedness with neighbors and friends in the local neighborhood” (Svensson et al., 2008, p.341). The feedback shows that this would be a technology, which is especially designed for elderly people and therefore is accepted by them. Their wishes of more functionalities such as coordinating and planning (Svensson et al., 2008) point out that also for them flexibility is an important criterion.

The wish for flexibility is also an outcome of Romero, Sturm, Bekker, de Valk & Kruitwagen’s (2010) research project in a resident home. Here, social and physical activities should work as mutual motivators. This means, if a person takes part in an event for being physical active, the social interaction is a side effect and vice versa. Romero et al.’s approach is to motivate the elderly people in a subtle playful way by monitoring. A system called Activator gives the participating elderly people an overview of “upcoming activities and own performances and goals” (Romero et al., 2010, p.485). For me, it was interesting that not creating new activities but encouraging existing daily activities is the main focus of the project.

In my opinion, a very sustainable way of thinking is determined by the project Senior:Interaction, a collaboration from 2009 to 2012 between the public care unit, the university researcher of IT University of Copenhagen and the Danish Design School and industrial partners. This project focuses on everyday activities, too. Its aim was to “design new horizontal service concepts that can strengthen social interaction among seniors in the urban environment” (Malmborg, Binder & Brandt, 2010, p.1). Inside the Senior:Interaction the concept of Super Dots highlights how to think of social media in a tangible instead of a digital way. The Super Dots (Fig. 1) are a type of wearable colored pins which are an approach to make active communities visible (Foverskov & Binder, 2011). Building on the idea that everyday activities are so called tickets-to-talk (Sacks, 2010), the color of each dot represents a community that has to decide unanimously on
an activity they do. If not the whole community agrees, a new community with dots in a new color has to be built. By wearing the *Super Dots*, the user enables the functions of seeking places or people inside the community and sending messages. (Foverskov et al., 2011).

A further development of the *Super Dots* concept which is more connected to networking in the neighborhood area is the application *Network Zone*. In this project, the aim was to strengthen networking around local activities in an urban environment (Fig. 2). With the help of the location-based mobile application, the elderly users could organize and report these activities. Through a blog and physical manifestations in the park (Fig. 3 and Fig. 4), people outside the network were invited to join (Malmborg & Yndigegn, 2013). In contrast to my project, the focus group here is still very active and open to new technology. Therefore, it makes sense to use the digital tools mentioned above. For me, it was inspiring that during the *Network Zone* project senior citizens organized their community more and more independently and also continued meeting after the project ended (Malmborg et al., 2013).
Another way to make activities visible to the community is the concept of the experiment *Twitterido*. Here, the idea is that activities get automatically twittered the minute a part of the community is doing something. This works by in an everyday artifacts embedded technology. For example, if a person puts his or her jogging shoes on and goes for a run, this activity would be twittered live in the person’s neighborhood (Nazzi, Bagalkot & Sokoler, 2010). Inspired by this, I started thinking more about the kind of artifacts elderly people usually have at home and which of them could be used for creating a *ticket-to-talk* and thereby encourage social interaction.

![markerClock](Fig. 5: markerClock) ![Display of markerClock](Fig. 6: Display of markerClock)

Riche and Mackay’s (2010) *markerClock* (Fig. 5), which is a clock equipped with a motion detector, is a modification of an artifact that already exists in the elderly people’s homes. The displayed information is easy to interpret because it follows the general-known rules of a clock face. The concept was developed out of the researchers’ observation that a group of elderly women, who are living close to each other, check on each other. For this way of caring, it is needed that the persons are aware of each others’ rhythms and can interpret their environmental clues such as closing shutters. Consequently, the elderly people do not need to ask their peers for help because they react and care if the observed behavior differs from normality. The *markerClock*, which was made for two persons and shows the activity over the past 12 hours (Fig. 6), should help to learn each other’s routines and later be able to recognize if something is different. As the user also sees her or his own activity history, it makes it easier for her or him to interpret the visualization of the peer’s activity. The effectiveness of the caring system also depends on the mode and the frequency of communication. The elderly women in Riche et al.’s (2010) project are aware of both regular activities like opening
the shutters and irregular activities like doctor appointments. The care support is integrated in their normal communication, but also implies social feelings. In order to give the peers possibilities to communicate to each other with the help of the clock, they can send symbols to the other peer’s clock display. In contrast to the other projects not the activity itself but the mutually caring gives a reason for interaction.

All in all, these works confirm my assumption that something is needed to give the elderly people a reason for social interaction, *ticket-to-talk*. Outgoing from the depicted Interaction Design projects, I started to research how these activities or the mutually support between elderly people look like. Additionally, for the design concept, I learned that in order to be sustainable the design concept should be something that elderly people have easy access to at home. They need to be independent of external help. In contrast to the focus group in my work, the elderly persons in the described Interaction Design projects are active and, except for the project at the residential home, it is not mentioned in the publications, if the participants are in need of assistance for example by the home care service.

3 Research methods

3.1 Fieldwork: interviews

At the beginning of my project, I used methods of fieldwork in order to get a better view of problems and existing structures in Malmö. Subasi, Fitzpatrick, Malmborg & Östlund (2013) argue that designers should “look into different contexts to get inspired for a particular problem in a particular context” (p.582). Key problems can differ a lot, depending on local situations. My starting points of the fieldwork were the meeting places in Malmö. Their goal is to reduce isolation and loneliness especially among elderly people. In order to learn from them I analyzed their way of working. My methods were observation, analyzing information material (online and printed) and mainly interviews with the staff and, if possible, with elderly people at the meeting places.

3.2 Ethnographic approaches

In the design process, I planned to collaborate with elderly people. According to Harley (2006), the methods for working with elderly people have to differ from the classical. He suggests ethnographic methods because ethnography elaborates rather the socio-
technical status quo than exploring potentialities. In order to collect data he proposes *Cultural Probes* (Harley, 2006). This is a method for artists and designers to collect inspirational data developed by Gaver, Dunne & Pacenti (1999). For gathering *Cultural Probes*, participants get a package consisting of things such as postcards, diaries, maps and disposable cameras to express her- or himself about a topic. The aim is to get unexpected input (Gaver et al., 1999). As it was not possible for me as a designer to go home to the elderly people and thereby enter their private space, this seemed to be a suitable method to collect inspirational data about their home and their everyday life.

Later in the design process, I wanted to co-design together with the elderly people. The report about the participatory design workshop in the *Super Dots* project (Foverskov et al., 2011) demonstrates that this is a useful way to make the concept of social networks accessible to elderly people. Thereby, it is possible to design tools for networking suitable for elderly people step by step together with them. For a successful co-design project, a thoughtful recruiting of participants is essential. The publications of co-design work with elderly people state that there is the risk to generalize them and the problem how to explain the whole design process and its aim without offending them. For example in one of the first meetings of the *Senior:Interaction* project, the problem came up that elderly people did not identify themselves as elderly and referred to other people they know or to their parents (Brandt, Binder, Malmborg & Sokoler, 2010; Malmborg et al., 2010). Therefore, the idea of situated elderliness has been developed. This means that instead of using generalizations, biological age or institutional categories to define the elderly, the focus rather lies on situations that make elderly people themselves feel old (Subasi et al., 2014, p.71; Brandt et al, 2010). Additionally, Brandt et al. (2010) suggest to identify communities of everyday practices instead of searching for individuals in order to recruit elderly people for co-design workshops. The idea was developed out of the concept of community of everyday practice by Lave & Wenger (1991). This term implies “participation in an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their communities” (Lave et al., 1991, p.98). My focus is communities of elderly people who like to do cultural activities. In terms of culture I think of music, literature or art. As this still is a wide context, I narrow my definition of culture down on the basis of the findings of the fieldwork.
3.3 Revised methods: literary research & scenario-based design

Unfortunately, it was not possible to establish a collaboration with elderly people and professionals in the elderly care since a thoughtful recruiting was not realizable in the scope of the project (see Chapter 4.2). As the attempt to co-design was unfeasible, I decided for a scenario-based design. Instead of collecting information with Cultural Probes and a co-design workshop, I tried to get the searched information by literary research. I read literature out of the field of social studies, gerontology, human factors, reports about the home care services and publications from Interaction Design and HCI projects examining collaborations with elderly people. The main objective of the literary research was to define requirements on the social interaction I am designing for and to get an idea of the situation of elderly people receiving home care service. I focused on the questions how elderly people’s everyday and social lives look like, what activities are fulfilling for them, which communication media and technologies they use and how they perceive support. Additionally, I got in touch with a very active elderly man who was open for interviews and meetings. He has an insight into the everyday lives of his peers who receive home care service. In the end I also got in contact with a woman, Sofia Hansson, who used to work for the home care service and she was willing to fill out a questionnaire about her working process and the elderly people she worked with.

Out of these findings combined with the outcomes of the fieldwork, I created personas who could be members of potential user groups in order to see how they would use the concept and if they can profit from it or not. Outgoing from the personas I created an everyday scenario for each of them. According to Carroll (2000), scenarios are “stories about people and their activities” (p.46). The purpose of scenarios is to underline aims and to show how a person would possibly interact with the design. Also, it depicts the users’ understanding of how the design affects them (Carroll, 2000). Additionally, “scenario representations can be elaborated as prototypes, through the use of storyboard, video, and rapid prototyping tools” (Carroll, 2000, p.47).

In my scenarios, I focused on an everyday story of an elderly person who is receiving home care service and examined how this elderly person would use my interaction design solution. Furthermore, I worked with storyboards in order to develop different use cases, because this was the best way for me to think about the settings at the elderly people’s homes and how their everyday activities could look like. Carroll (2000) argues that the function of scenarios is to understand the situation and to find solutions, which
are concrete but also flexible. I used the scenarios in order to “try things out and get directive feedback” (Carroll, 2000, p.54). In order to get an impression under which technical conditions the concept is feasible, I also designed rapid prototypes. In scenarios, the usage experience should be described specific enough, so that it “could be prototyped and tested” (Carroll, 2000, p.54). This is one of the reasons why I decided for a scenario-based design. As I did not have the possibility to try out my concepts, the scenarios should help other researchers to be able to prototype and test the design in the future.

4 Exploration

4.1 Fieldwork: the problem domain

As the design concept should be developed out of activities (see Chapter 2), the first part of my fieldwork focused on activities for elderly people in Malmö, with a stress on social and cultural activities. The other part inquires the social content in home care receivers’ lives.

4.1.1 Identify possible activities

First, the following chapter gives an overview of activities offered for elderly people and how to find out about them. It seems that in Malmö elderly people have to know where to go if they would like to take part in cultural activities. At the Tourist Information or online at malmo.se/evenemang, there is no brochure or filter for senior citizens, only for families and children. Events such as theatre or cinema for elderly persons happen at special institutions, for example at meeting places for elderly people. Also here it seems that elderly people have to know that these meeting places exist. According to Anders Lundberg (personal communication, April 13, 2015), most elderly people come because they simply know the place exists. In Malmö, the meeting places are located in the five city districts – North, South, East, West and inner city. There are ten meeting places and some of them are not exclusively for elderly people, for example the meeting place in Limhamn in West Malmö. Also the sizes of the meeting places differ a lot. For example Dammfrigården and Tuppen, which are located in inner city of Malmö, are very big. Possibilities to get informed about these meeting places and their activities are the website of the municipality of Malmö, which promotes the different programs, and a
printed version of the monthly program, which is available at the meeting places. Some meeting places also have a facebook page (Stephanie Wihlborg, personal communication, April 16, 2015). That it is the activities that trigger people to come shows the story of one elderly woman I interviewed (personal communication, April 16, 2015): One day she saw a weaving loom from outside the meeting place in Limhamn and she went inside to ask who is allowed to use it. The answer was “you”. Since then she regularly goes to the meeting place and met a lot of new friends there. This is an example for networking around an activity. First there was the activity, and the social contact was an additional effect. However, this is not guaranteed. Therefore, according to Stephanie Wihlborg (personal communication, April 16, 2015) who is responsible for the meeting place Dammsfrigården, it is one of her main tasks to take care that nobody gets segregated. She observes that elderly persons do not want new people to join their group. Thus she has to encourage them to welcome new people or to organize activities in which the elderly persons get to know each other subconsciously (personal communication, April 16, 2015). For elderly people who want to get to know new people, she has developed the concept Relevanta Bekanta (Relevanta Bekanta, n.d.). It is for elderly persons who feel lonely but do not know how to handle the problem and want to break the pattern. The activity is like speed-dating (Fig. 7 and Fig. 8). The elderly people, who are participating, have never met before. They are changing tables during the event, and in the end they can exchange telephone numbers. This concept is working really well, even though it is a big step for elderly people to participate: Their curiosity often defeats their skepticism (Stephanie Wihlborg, personal communication, April 16, 2015). Thereby, the concept shows that it is possible that elderly people combat their loneliness by trying out new things and meeting foreign people.

Fig. 7: Relevanta Bekanta 1

Fig. 8: Relevanta Bekanta 2
4.1.2 Criteria for activities

In order to learn for my design concept how activities for elderly people have to ideally be organized, I first explored how the different meeting places set up events. According to Shkurte Makoli (personal communication, April 15, 2015) who is working at the meeting place Seniorum in Malmö, an important factor is the location of the activity and how people can get there. If the location is not close, the elderly people become dependent on another person since using public transport is too unsecure and challenging for them. Once, Shkurte Makoli (personal communication, April 15, 2015) and her colleagues tried to organize a visit to a theatre. There were many people who were interested but in the end only those, who could bike, were there. Since then, they have gone to further events altogether in a group using the public transport. However, to organize these trips demands time (Shkurte Makoli, personal communication, April 15, 2015). For Anders Lundberg (personal communication, April 13, 2015), who is the coordinator of the meeting place Tuppen, it is not possible to organize these kinds of visits. The reason is that Tuppen is a bigger meeting place than Seniorum (Stephanie Wihlborg, personal communication, April 16, 2015) and Anders Lundberg does not have enough time and staff. Therefore, the activities at Tuppen take place on location (Anders Lundberg, personal communication, April 13, 2015). Additionally, the activities at the meeting places are more and more carried out by the elderly people themselves (Shkurte Makoli, personal communication, April 15, 2015; Stephanie Wihlborg, personal communication, April 16, 2015). This demonstrates that the approach of the project Network Zone to support horizontal structures (see Chapter 2) starts to be realized in the meeting places to some extent.

The second question I examined is how the activities at the meeting places are organized so that they are convenient for elderly people. One elderly women I interviewed thinks that for elderly people, who cannot live on their own anymore, bingo is a perfect activity because it does not demand thinking (personal communication, April 16, 2015). According to Shkurte Makoli (personal communication, April 15, 2015) from Seniorum, who studied elderly pedagogue and has been working in the home care service for seven years, it is important for elderly people to succeed, and therefore, the activities have to be designed in a way that elderly persons can achieve them. Consequently, the difficulty of an activity for an elderly person depends on the person’s physical and mental health status. A fulfilling activity does not have to be something special or big because the small
things can already totally change the perception of the everyday life. Shkurte Makoli (personal communication, April 15, 2015) refers to a project called Guldstunder i de äldres vardag (Special moments in elderly people’s everyday lives). The project took place at different sheltered housings in Malmö from 2007 to 2010 (Ljungberg, 2009). The aim was to give elderly people’s everyday lives a meaning by having a good conversation, being outside in the garden or evoking good memories. In order to trigger memories, the staff and the residents of the sheltered housings went to the beach or for a walk at places where the elderly people used to promenade; they also played and listened to music together with them (Fig. 9) and refurnished the homes in an ancient style (Fig. 10). Again, it does not have to be huge activities or excursions, but it should be something the residents will be talking about for a long time (Ljungberg, 2009). This example made me reflecting the kind of activity which should give a reason for social interaction in my project. Could experiencing music or literature at home create a special moment just as well as the activities in Guldstunder i de äldres vardag? By staying at home, the elderly people would skip the challenge of getting somewhere and could have a positive moment independently from help. Based on this interpretation of Guldstunder i de äldres vardag, having a special moment corresponds to experiencing culture.
4.1.3 Home care receivers’ social lives

As the focus of my master project is elderly people who stay at home, I investigate in home care service receiver’s activities and social interactions in the everyday life. According to Shkurte Makoli (personal communication, April 15, 2015) the elderly people receiving home care service are mostly subject to social isolation. This was one reason for the realization of the project Ökat socialt innehåll för äldre i ordinärt boende (Increasing social content for elderly people receiving home care service) in Malmö from 2011 to 2012. One aim of the project was to open up the discussion about the value of social needs compared to the value of physical ones. The starting point was how the staff of home care services was meeting a person, but it was also about the need for activities and the *small extra* that could build social content in elderly people’s everyday lives. A big part here is to motivate the care recipients to risk things and to become more independent in their social lives (Fransson, 2013). According to Stephanie Wihlborg (personal communication, April 16, 2015), increasing the collaboration between home care and meeting places staff would be one way to improve the social lives of elderly people who are receiving home care service but are still able to leave their homes. An example for a possible activity is a dinner at the meeting place *Träffpunkt* that was organized for lonely elderly people receiving home care service. Everything was organized by the home care service and only the location was provided by the meeting places (Shkurte Makoli, personal communication, April 15, 2015). A new computer program called *Laps Care* makes it easier for the home care service to schedule and organize such kinds of social activities (Hultenmo, 2011). In order to reach home care receivers who still can leave home, Stephanie Wihlborg (personal communication, April 16, 2015) wishes that the home care service staffs at least take the printed programs of the meeting places with them, when they get the food programs for the week, and give it to the elderly persons. An elderly women I interviewed (personal communication, April 16, 2015) does not get home care service herself but still has experience with that kind of help: Some of her friends receive the service and she even worked there. Therefore she knows that the professionals have strict lists with what they have to do and no time to sit down and talk or even go out for a walk. She thinks that contact to other people and to get to know what is happening outside is needed so that the elderly people do not lose the connection with reality (elderly women at the meeting place in Limhamn, personal communication, April 16, 2015). A report about home care services (Swan, Sjöström, Isaksson & Blusi, 2012) discloses that for the receivers social content in their
everyday lives is important. One wish of the respondents is to be part of a social context. For them, this means to meet other people, to get the possibility to go to a meeting place or even to only hear somebody’s voice (Swan et al., 2012). The last aspect stuck out for me and I was thinking that this could probably be created with the help of technology and experienced independently of somebody else’s help and the physical abilities of a person. In a report about the home care services in Rosengård in Malmö, some elderly people told that they feel insecure if they do not know their neighbors because many of their peers moved away (Hansen, 2008). This approves my design aim to support the social interaction in the direct neighborhood.

Summarizing, I got especially inspired by the projects Relevanta Bekanta, which follows the speed-dating principle, and Guldstunder i de äldres vardag, which proposes to create special moments in elderly people’s everyday lives. For my thesis, I defined the cultural experience as a special moment. In the following, I try to explore this kind of moment: How can it be created by the help of interaction design and how can social interaction with peers from the same neighborhood be embedded into it?

4.2 Ethnographic research: collaborating with elderly people

In order to explore my research questions, I tried to collaborate with staff from home care services and with elderly people, who feel lonely, stay at home and do not use digital devices for networking. Unfortunately, the managers of the home care services and their staff did not have the time and the resources to collaborate with me. Therefore I tried to find elderly people who would like to collaborate with me at the meeting places. At the meeting place in Limhamn, I got in contact with four elderly women who were interested in cultural activities, and asked them for a meeting.

To the meeting with the elderly women, I brought the Cultural Probes packages (Fig. 11) that were an attempt to gather data about what the nice moments in the everyday life (Guldstunder) for elderly people are. In a workshop for elderly persons, Brandt et al. (2010) used a kind of workbook for gathering stories, and in the Super Dots project, written texts for the elderly people were simple and in the language level of a child (Foverskov et al., 2011). Because of that I was aware of keeping the task for the Cultural Probes as easy as possible. So, I prepared tasks for two days that the elderly women could try to do during one week. The tasks were explained in small steps on two cards (Fig. 12), one for each day. My packages consisted of a disposable camera, a diary and
stickers. On the first day, the elderly people should take a picture of things at home that remind them of a nice moment in their everyday life (*Guldstunder*). If they wanted, they would have had the possibility to write a title or a word, describing this moment, to each picture in the diary (Fig. 13) and to depict a kind of music they think of in that moment. On the second day they should only collect the little moments of that day by writing a title and/or describing a kind of music in the dairy. At both days they would have had the option to glue in a heart shaped sticker if they wished to share this moment with somebody.

![Fig. 11: Cultural Probes – one package](image1)

![Fig. 12: Cultural Probes – tasks](image2)

![Fig. 13: Cultural Probes – diary](image3)

When I presented the tasks to the elderly people during the meeting, I immediately realized that these are too many and too difficult for them. They did not know how to use a camera or thought finding a song title for different kinds of little special moments in their everyday lives is too difficult for their age. Thereby, I learned how supposedly easy tasks can be very difficult for elderly people. Later, I also read that for example in Romera et al.’s project (2010) the use of cameras was more difficult than they thought. Instead of giving them the packages, I asked the elderly women how I could change the tasks to make them interesting and doable for them. However, as they did not feel
involved in the design process, they considered the tasks to be too much effort for them anyway. As I could not give the elderly people at the meeting place in Limhamn the Cultural Probes packages, I discussed with them what a special moment in everyday life is for them. For all five little special moments are when they are together in a group and talk about everything under the sun. One of them also thinks that it is a special moment when she sees her two cats in the morning (personal communication, April 16, 2015). Consequently, it is again the small things and the social contacts to other people, which can change the meaning of a day totally. This strengthens my definition of experiencing culture as having little special moments in everyday life in Chapter 4.1 and justifies my research.

All in all, at that meeting I understood that the elderly women wanted to do me a favor and were pushed by the staff of the meeting places to collaborate, so they did not participate completely voluntarily. For me, this is against the idea of co-designing or other kinds of collaboration in a design process. A lot of time has to be spent in the collaboration with elderly people to make clear about what the project is, what their role is and how possible tasks will look like. When these requirements are achieved, the actual design work can start and even then, a lot of time is needed to make tasks clear and to gather data in small and simple steps. This was not possible in the scope of a ten weeks project. The setup of the project would have been easier if I could have built it on existing structures, namely existing communities of practice (see Chapter 3.2). Thereby, the tasks or a design workshop could have been integrated in regular activities. But for this, the help of professionals in the elderly care would have been needed. Unfortunately, this kind of collaboration was not possible. Therefore I had to change my research method to scenario-based design draw upon fieldwork and literature (see Chapter 3.3).

4.3 Literary research: the user group

As my design is supposed to be a tool for networking, profound information about elderly people’s lives were needed. Otherwise there is the high risk that my result is “based on quite simple assumptions” (Lindley, Harper & Sellen, 2008, p.77). The following chapter thus summarizes findings in the fields of HCI, gerontology, human factors and social studies about elderly people and their social lives.
4.3.1 Meaningful relationships

For elderly people, having few close friends is more important than having a lot of them. According to Due, Holstein, Lund, Modvig & Ablund (1999), it is the close friends that stay even if you become old. A friendship, which it is worth to invest in, should be emotionally satisfying and meaningful (Carstensen, Fung & Charles, 2003, Carstensen, Gross & Fung, 1997). If the relationship does not fulfill this criterion, elderly people tend to cultivate the friendship less. For the design concept, this means that the supported social interactions need to be meaningful and the aim should not be to increase the size of the network in general. Because of the described requirements for a friendship, it is natural that the social network of a person diminishes and therefore this is not always a reason to be concerned (Lindley et al., 2008). However, especially elderly people are exposed of threats to their social network. Typical risks are that the elderly person her- or himself or her or his friends move away or that peers pass away (Baecker, Sellen, Crosskey, Boscart & Neves, 2014). These factors influence older adults’ social relationships against the elderly people’s will. Distance, for example, becomes more and more difficult to bridge since the elderly persons’ health limits their mobility (Melenhorst, 2002). Hence, signs of aging, especially limited cognitive abilities (Degnen, 2007), but also other “health and functional limitations” (Bonifas, Simons, Biel & Kramer, 2014, p.1320) make social interactions difficult. It is alarming if the “access to significant relations” (Borglin, Edberg & Hallbarg, 2005, p.213) is missing because this is one of the main parts of quality of life, according to Borglin et al. (2005). This was also the outcome of a study in the field of Gerontology and Geriatrics Research in 2013. Here, the demand for a supportive network was especially important for disabled elderly, as they are even more in need of friends and neighbors they can rely on (Avolio, Montagnoli, Marino, Basso, Furia, Ricciardi & de Belvis, 2013). This points out one of the essential roles of peers, namely support.

4.3.2 Different perceptions of support

The support among peers can include both exchanges of material goods and emotional support such as supportive and caring conversations (van Tilburg, van Groenou, Broese & Thomése, 1995). As put forward in Chapter 2, environmental clues and frequent contact help the peers to care about and support each other if help is needed. Environmental clues are more useful for this kind of neighborly care than personal clues (e.g. voice and body position) because the peers must know each other even better and
additionally they have to see each other face to face to be able to interpret the latter (Riche et al., 2010). Maybe therefore, peers living in close proximity improve both life expectancy (Giles, Glonek, Luszcz & Andrews, 2005) and quality of life (Van Groenou, 1995). Nevertheless, also the environmental clues disappear more and more. According to the elderly men I interviewed (personal communication, April 29, 2015), he rarely sees his older neighbors because they even do not need to go out to get their mail. Therefore I think one way to increase social interaction in the neighborhood would be to make routines more visible in the environment. In the project from Romero et al. (2010), which I described in Chapter 2, the participating elderly people felt more fulfilled if they can help others in their network. According to Riche et al. (2010), it seems to be easier for elderly people to accept help if they know that they can help the other person, too. The social exchange has to follow the principle of reciprocity. Here they correspond to van Tilburg et al.’s (1995) analysis of reciprocity in elderly people’s social network. In this study, reciprocity is defined as a bi-directional exchange in which no one should give more or less support than the other one (van Tilburg et al., 1995). Thus, Riche et al. (2010) apply their findings to the relationship between the elderly women and equate the messages between elderly people with the exchange of gifts. They refer to the sociologists Mauss (1967) and Bourdieu (1997) who analyzed reciprocity and the exchange of gifts in their works. According to Riche et al. (2010), a response to a message acknowledges the message, namely the gift, and at the same time it is a present itself. Getting in such kind of exchange “marks the beginning of an acknowledged relationship” (p.84). This confirms Lindley et al.’s (2008) findings that a peer relationship should follow the principal of symmetry. In contrast, elderly people prefer an asymmetric care and relationship to their families. They used to be looking after their children and grandchildren and when they become older and possibly unable to look after themselves, they have difficulties to accept a change of roles (Lindley et al., 2008). According to Krause’s survey (2007), tangible support such as help in the household makes elderly people feel dependent and incompetent. Independence is one of the things elderly people defend. The reactions of the elderly persons interviewed by Spitze and Gallant (2004) make it clear how much senior citizens want to be perceived as independent of their families. Maybe therefore, peer contact is more essential for them than contact to relatives. Accordingly, the absence of friends influences the mental health in a much more negative way than the absence of family (Fiori, Antonucci & Cortina, 2006). Another reason could be that elderly people have the feeling that their children
and grandchildren “have their own life” and good friends are more reliable and more helpful in crises (Riche et al., 2010).

It is often argued that Aging in Place with the help of home care service is better than moving to a resident home because thus the person can stay in her or his familiar environment (Perez, Fernandez, Rivera & Abuin, 2001; Borglin et al., 2005). But also receiving home care service changes elderly people’s lives a lot. Their homes lose the private and sheltered character since strangers, namely the assigned home care service staff, enter this area. Additionally, the home care service structures elderly people’s time: They have to be ready to receive the care (Glasdam, Praestegaard & Henriksen, 2013). In their studies about a man receiving home care service, Glasdam et al. (2013) observed that “the client often closed his eyes in the forced but necessary togetherness, which could be regarded as a silent resistance against his life conditions and the health-care system to which he has to be subject, as a silent whisper, ‘do what you have to do; I am not present’” (p.89). The observed family’s attempt to overcome this situation is to treat the home care professionals as friends (Glasdam et al., 2013), which underlines that receiving help from peers is acceptable for elderly persons and their relatives. Nevertheless, the home care receiver in Glasdam et al.’s (2013) field study still suffers from the feeling of dependence and discipline. A possibility for him to escape this home that seems to be like a prison would be to go outdoors. But here, the help of somebody else is needed and this kind of help is not part of the professional service (Glasdam et al., 2013). To experience a fulfilled Aging in Place, interpersonal communication is unalienable (Riche et al., 2010). The practices in the home care service show how important a contact to a peer and to the world outside the flat is. To meet other people can become problematic if a person cannot leave home without somebody else’s help and additionally if they are scared that other could take advantages of their hospitality and “never leave and always come back” (Riche et al., 2010, p.86), and therefore prefer to meet outside, as the elderly people in Riche et al.’s project (2010).

Summing up, in my design concept, the social interaction between peers from the same neighborhood requires following the principal of reciprocity. Thereby, experiencing social contact should be private and preferably independent of the help of relatives or the home care service. At the same time, it would be interesting if it was possible to create a feeling of closeness and social interaction reaching outside of home. As my design concept is that social interaction should be made possible by so called tickets-to-
talk (Sacks, 2010), it is needed to take a detailed look at elderly home care receiver’s everyday activities.

4.3.3 Home care receivers’ activities

In general, elderly people avoid getting disappointed and experiencing negative things (Carstensen, 1993). Additionally, they are present-oriented (Melenhorst, 2002) because of their position in the lifecycle (Carstensen & Fredrickson, 1998). Consequently, elderly people need to know the outcome of an activity and if it is successful in order to be willing to do it. However, they often estimate false what they are able to do and how much time and effort a task is demanding (Hirsch, Forlizzi, Hyder, Goetz, Kurtz & Stroback, 2000; Phillips, Schneider & Mercer, 2004). In order to identify activities that are easy to perform, I got inspired by Everard, Lach, Fischer & Baum’s (2000) division of elderly people’s activities into four categories: instrumental activities, social activities, high-demand leisure activities and low-demand leisure activities. For my design concept, the categories social activities and low-demand leisure activities are most interesting. Accordingly, elderly people feel and think positive because of little things and social contacts, as likewise analyzed in the concept of little special moments in the everyday life (Guldstunder i de äldres vardag, see Chapter 4.1.2). “Even if they missed an important event but they had a nice talk with a friend they feel satisfied about it” (Romero et al., 2010, p.489). This again confirms my focus on small exchanges rather than on a huge activity. My experience in the collaboration with the elderly women at the meeting place in Limhamn and also the fact that it takes time to be aware of other people’s routines (Riche et al., 2010) make it clear that it will take time to achieve the main goal of a long-lasting social contact. In order to not make the experience frustrating, the small achievements in-between have to be in the focus. Nevertheless, a challenge is to motivate elderly home care receivers to become active.

The elderly man I interviewed (personal communication, April 29, 2015) thinks that for his friends who receive home care service the weekend and weekdays are characterized by the same monotony. He himself is a very active elderly man, who tries to motivate his peers to do something. Usually, his friends only watch TV passively. When the interviewed elderly man visits one of his friends, he often reads from books for her. This usually wakes up memories in her and she takes a book from her bookshelf and reads aloud herself. In former times, she used to meet friends from the theatre at home and they were drinking wine and talking about culture. Now all of these friends have passed
away, and with them this kind of activity vanished. The woman therefore has become quite passive (personal communication, April 29, 2015). Although her mind is clear, she needs a peer to motivate her and to wake up the memories about things she used to do. Hence, even if one requirement to social interaction between peers is symmetry, I got inspired by the idea that active elderly people can motivate passive ones. Especially, the concept that memories activate a person stands in close relationship to the concept of *Guldstunder i de äldres vardag*.

Another question, which is also interesting for the design concept, is when the social interaction will take place. In Romero et al.’s (2010) research project, the elderly persons want to be flexible but at the same time need routines. They do not want to go for spontaneous activities, but are able to welcome friends or families spontaneously. Additionally, they are unsure whether other peers would like to do something. According to Romero et al. (2010), elderly people wish to “feel in control of when and what to do at any moment” (p.489). If they meet their peers, it can be regularly such as on a weekly, monthly or yearly basis but also sporadic such as a reunion meeting (Romero et al., 2010). Additionally, Swan et al. (2012) indicate that continuity creates a feeling of security and is especially important in elderly people’s lives. In scenarios, it has to be tried out whether the social interaction in my design follows the principle of flexibility or the principle of routines.

### 4.3.4 Used technologies and communication media

As I put forward in Chapter 2, it is helpful if the Interaction Design is based on technologies that already exist in the elderly’s home in order to make it easy for the user to adopt it. Sofia Hansson (personal communication, May 8, 2015) who was working in the home care service observed that the technologies elderly people usually have at home are radio, TV and sometimes laptops. According to a report (Hjalmarson, 2014), there is a big group of people, mostly women, who have bad economy because of low pension and therefore no access to new technologies (Hjalmarson, 2014). For me, the radio was especially interesting because of the home care service receiver’s wish to hear somebody’s voice, mentioned in Chapter 4.1.3 (Swan et al., 2012). Therefore the question came up if a radio can be used in my design to hear their neighbors’ voices. When I talked about technology with the elderly women at Limhamn meeting place, they mentioned that all except one listen to the radio the whole day. They even could not believe that the one without radio can live without it (personal communication, April 16,
When I asked the elderly men if his peers listen to music or radio, he mentioned that once he asked one neighbor who also receives home care service about which music she likes. Her answer was Frank Sinatra, and according to the elderly men there is not so much Frank Sinatra nowadays on the radio (personal communication, April 29, 2015). Thus, in my opinion the radio would be an appropriate medium for the target user group to create little special moments in their everyday lives. Additionally, in order to embed social interaction in these special moments, it is needed to know which kinds of communication media the elderly people prefer. In the interviewed elderly men’s opinion, elderly people prefer letters as a first contact medium because the people he knows are scared that somebody could misuse phone calls or a stranger could knock on the door (personal communication, April 29, 2015). The elderly women in Riche et al.’s (2010) project, who already know each other well, usually call, have chats over the intercom or write letters in order to communicate with other people. Thus, I focus on writing letters but also on calling people as communication media in my concept.

5 Design process

5.1 Personas and their everyday lives

In order to design close to the potential users, I developed three types of personas. This main distinction is inspired by the three groups who receive home care service: the first group only gets help with service works, the second group needs most help and the third group is in the situation of changing from independent to dependent and receives service help and to some extent care (Hjalmarson, 2014). Additionally, the personas are characterized by their social networks, positive things such as trying to be mental fit, negative things such as threats for a shrinking networks in their current life situations, and activities they do. The sources for that are the above mentioned discoveries from the observations, interviews, research in literature and especially the inputs from Sophia Hansson who works for the home care service and from the elderly men I interviewed. The personas should help to see how different groups of potential users would interact with the design work and what their motivations would be to use it. As mentioned in the Chapter 4.3.4, especially women do not have access to new technologies because of economical reasons (Hjalmarson, 2014) and therefore two of the three personas are female.
Fig. 14: **Persona 1 – Hilde**

- **8:00** gets up & makes breakfast
- **9:00** reads the newspaper
- **10:00** the home care service comes & cleans her flat
- **11:30** makes lunch
- **12:00** eats lunch
- **13:00** goes for a short walk
- **14:00** knits while watching TV
- **16:00** calls an old friend who lives far away
- + mentally fit, interested
- - shrinking network, shallow contact in the neighborhood
- **17:00** eats dinner
- **18:00** reads a book
- **21:30** goes to bed

**Hilde, 81**

- Widow, moved to a new area close to facilities, interested in politics, loves to knit
- receives services

Fig. 15: **Persona 2 – Marie**

- **9:00** home care service helps her with the personal hygiene
- **9:15** home care service makes breakfast & gives her medicine
- **10:00** watches TV
- **12:00** home care service comes again, prepares lunch & gives her medicine
- **13:30** assisted transport drives her to the meeting place, she plays Bingo there
- **15:00** assisted transport drives her home, at home she takes a nap
- **17:00** eats dinner
- **17:30** home care service comes, looks if everything is ok
- **19:00** goes to bed & watches TV until she falls asleep

**Marie, 80**

two children & one grandchild, one of her children lives close, full service & assistance, she goes to the meeting place twice a week, used to be very active & travelled a lot

happy & appreciates everything in her life, lived a colorful life

suffers from sickness & memory loss, needs more help every day that passes, feels lonely
The first persona, Hilde (Fig. 14), belongs to the first group who only receives the services such as cleaning, grocery shopping and doing laundry (Hjalmarson, 2014). Even if for this group mainly the service and not the treatment of the home care staff is important, the persona in my case is interested in getting to know their neighbors. The reason for this is that the 81-year old woman is widowed and moved to a new area closer to facilities. Thus, she only has a few social contacts. The persona is open to new things and tries to stay mentally fit, reads newspapers, watches TV or knits. Here friends and her daughter live far away. A typical day could look like that: In the morning, she eats breakfast and reads the newspaper. At 10:30 comes the home care service in order to go grocery shopping for her. At 12:00 she cooks and eats lunch. In the afternoon, she goes for a short walk and later an old friends who is living far away calls. In the evening, she eats dinner while watching TV and she goes to bed early.

The next persona, Marie (Fig. 15), is inspired by the second group of people who need most help (Hjalmarson, 2014). She is a woman who the home care service staff visits three times a day. In the morning, the staff makes breakfast, helps with the personal hygiene, gets her dressed and gives her medication. At lunch time, the home care service brings her food and makes sure that she takes her medications. In the evening, the purpose of the home care service visit is to see that everything is alright. Once a week,
the persona gets help to shower, to take care of her hair and twice a week, the service goes grocery shopping for her. Her main breakdown is the loss of memory, her sickness and the weakness of her body. She is very positive, has contact to her family and some friends, and twice a week the assisted transport drives her to an activity at the meeting place. However, she feels lonely. The everyday life of this persona is especially inspired by the description of one of the persons Sofia Hansson visited when she was working at the home care service (Sofia Hansson, personal communication, May 8, 2015).

The third persona, Bengt (Fig.16), is part of the in-between group who are in a situation of changing from independent to dependent (Hjalmarson, 2014). This group is most critical about the help they receive (Hjalmarson, 2014), maybe because independence decreases the meaning in life, as shown in Chapter 4.3.2. Besides normal services, my created male persona gets assistance for breakfast and lunch and for taking her medication in the morning. He feels lonely because his wife died a few years ago and lately more and more friends have passed away or are not able to leave home any more. If he goes out and sits on a bench in the neighborhood in the afternoon, he rarely meets his neighbors. He does not like to go to meeting places, instead he makes crosswords – mostly in the morning – and watches TV – mostly in the evening. His wife loved to dance and when he is listening to music, he thinks about former times, but he often forgets to turn the music on. Unfortunately, his son has to work a lot and therefore has rarely time to visit him.

5.2 The concepts PeerRadio and PeerLight

Out of the findings above, I developed two kinds of concepts for an exchange between peers in a neighborhood that should create nice interruptions in everyday life.

The aim of the first concept is that the users get visited by their neighbors without letting them in and thereby get to know who is living next door. The user can take part in a local radio program that will be received by elderly peers in the neighborhood. The idea is that by sharing some information it could be possible to find something in common as in the speed-dating program Relevanta Bekanta or to have a reason to talk to the neighbors as in the project with the tickets-to-talk by Svensson et al. (2008). The personal information could just be a voice message, for example a quote out of a book such as the interviewed elderly man reads for his friend. It could also be a favorite song. The content should trigger memories and thereby activate people. Hearing the
neighbors’ voices should transmit the feeling of being part of a social context. Additionally, there should be the possibility to get in touch with each other in order to develop a meaningful relationship beyond the radio program.

The second concept is focused on daily exchanges between two people and should create environmental clues in order to support caring among peers. The interaction happens more discretely here. I was thinking of a lamp that enables an exchange between two persons. The exchange could happen via light signals or voice messages. The main interactions could be a morning and an evening greet. The idea is especially inspired by Riche et al.’s (2010) concept of peer care. In my case the peers do maybe not know each other; they only have signed up at the home care service to voluntarily take care of a peer in the neighborhood. By caring for each other a close peer relationship probably will develop over time. So far, the concepts are quite vague and will become more concrete via the validation by the scenarios in the following chapter.

5.3 Scenario-based design

In order to try out what people would do with the systems depicted above and to make concrete design decisions, I designed different kinds of scenarios for the two concepts. In the following, I will call the first concept PeerRadio and the second one PeerLight.

5.3.1 Scenarios for the concept PeerRadio

In the case of the PeerRadio the questions how to receive the program and how to take part in it are most relevant for the interaction design.

How to receive it?

First, I will focus on the question how the user receives the PeerRadio. Here the interaction design but also the technical solution is from interest. As the elderly people I focus on do not have access to new technology, the idea is that they can use their own radio as a receiver for the PeerRadio. The program should only be available for one neighborhood. In my low-fi prototype (Fig. 17), I used a FM transmitter for mobile phones that is designed for listening music with the car radio. My receiver is a normal radio. In order to see how far a FM transmitter has to reach out for a local neighborhood and how many people can listen to one program, I explored the conditions for the example of Malmö. In Malmö, the home care service is divided in areas see Chapter 4.1.1. In the inner city which is 7.68 km² big (employee of Malmö Stadsbyggnadskontor,
personal communication, May 11, 2015) about 1,508 people receive home care service (employee of Malmö Stadskontoret, personal communication, May 11, 2015). Here the denseness of people receiving home care service is the highest: There are about 196 people per km². In comparison, in the other region there are about 23 to 33 elderly people receiving home care service per km² (employee of Malmö Stadbyggnadskontor, personal communication, May 11, 2015; employee of Malmö Stadskontoret, personal communication, May 11, 2015). The inner city is divided in five different home care service areas (Stephanie Wihlborg, personal communication, April 16, 2015). That means that in the inner city of Malmö one home care service is on average responsible for 39 people in an area of 0.2 km². The home care receivers of the same home care service live close together since the determining factor for a route of the home care service staff is geographical closeness in order to save time (Hjalmarson, 2014). The range of a FM transmitter depends on different factors, namely on the configuration of the transmitter itself such as transmitter power, antenna gain and height of the antenna, but also on, external influences such as regional building density or other obstacles (ZHC FM&TV Transmitter, 2012). Online, there are instructions how to build a FM transmitter which reaches distances of 1-2 km (Wirmer, 2015; Chhabhaiya, 2012; Electronics Hub, 2014). This would be enough for a local radio for one neighborhood. In order that the radio is legal in Sweden, it has to be registered at the Authority for Radio and Television (Myndigheten för radio och tv) and a fee has to be paid. Private people or companies, who are not controlled directly or indirectly by the state, county or municipality and who have the equipment and finance to carry out the broadcast throughout permitted period of eight years, can get permission for a radio program. The idea is that elderly people maintain PeerRadio and not the home care service. This would also avoid legal issues that the home care service is public. The FM frequency of the PeerRadio has to be one that is not used by other radios. As FM frequencies can go from 87.5 to 108 MHz, the number of analog broadcasted radio programs are limited (Myndigheten för radio och tv, 2010). Thus, a challenge is to find an unused frequency on which the PeerRadio can be broadcasted. In Malmö the FM frequency 103.5 MHz is available at the moment (Radiomap, 2015).

The person who wants to listen radio program needs to know on which FM frequency the PeerRadio is sent. Ideally, the home care service informs the potential group of receivers both written and oral about it and take care that the person got the
information. In a report about home care service in Malmö one of the interviewed people did not know about meeting place close by even if he got a flyer about it at home (Hansen, 2008). As elderly people become more and more forgetful, the home care service should also hand out stickers that can be glued on or next to the radio and show the FM frequency.

![Rapid prototype of PeerRadio](http://www.franziskatachtler.com/MAHthesis/PeerRadio.html)

Fig. 17: Rapid prototype of PeerRadio
Click here to see the video documentation:
http://www.franziskatachtler.com/MAHthesis/PeerRadio.html

![Marie forgets to turn PeerRadio on.](image)

Fig. 18: Marie forgets to turn PeerRadio on.
The home care service staff makes Marie breakfast.

The staff turns the radio on, so Marie can listen to PeerRadio.

The home care service staff is leaving. She says goodbye to Marie.

Marie is listening to PeerRadio.

**Fig. 19:** The home care service turns *PeerRadio* on.

Bengt drinks coffee with his son.

His son says goodbye to Bengt.

Bengt turns his radio on in order to listen to PeerRadio.

He missed the beginning and is sad about it, but he is happy that his son was there for a visit.

**Fig. 20:** Missing the beginning of *PeerRadio*
Another design decision is when the user can receive the program. The criterion is that elderly people like routines but at the same time want to be able to be spontaneous (see Chapter 4.3.3). Therefore, one thought is that the program is available on a regular basis, either at one point or during a longer period. If it is broadcasted during a longer period, the elderly people can decide when they want to listen to it. Since one of the personas, Marie, is very forgetful and possibly does not remember to turn the radio on (Fig. 18), it would be nice if the home care service turns it on when visiting her, more precisely when leaving again, so that Marie is alone and in a private situation (see Chapter 4.3.3) while listening to the radio (Fig. 19). However, the time when the home care service staff visits the elderly people differs a lot. Sometimes it depends on when the client has to take medicine; sometimes the home care service has difficulties to come at the agreed time (Hansen, 2008). Not only the visits of the home care service but also spontaneous visits can conflict with the broadcasting time (Fig. 20). Therefore, it would be good if the program were available for a longer period. But if the PeerRadio loops, it becomes unclear when it starts and the chances are high that the user will miss the beginning. It would be easier for the elderly persons to schedule their radio listening if PeerRadio played at a certain time. This would also give the elderly persons continuity (see Chapter
4.3.3). Additionally, it makes clear when the neighbors could have heard a program and the user can contact them to talk about it. That is very important because the program should work as a so-called *ticket-to-talk*. For example the male persona, Bengt, who misses to meet his neighbors outside, can contact his neighbors after listening to the program. That could be complicated in case of a looping program (Fig. 21). For the proposal of contacting other elderly people, I was thinking of two different possibilities. One is that the home care service, which has the same group of elderly people, could take letters that the users wrote to other home care receivers of the same area and bring them to the addressees. Thereby, the user would become even more dependent on the home care service, and I therefore developed another possibility of contacting. When the home care service informs the elderly persons about the *PeerRadio*, they also get a list with the addresses and telephone numbers of all home care service receivers in the neighborhood. Thus, the elderly people can contact each other independently from the home care service and its visit routines.

_How to take part?_

Another interesting question out of interaction design perspective is how people can take part in the *PeerRadio*. Here it is again very important that the method to contribute to the program is as independent from the home care service as possible. The idea is that at the beginning especially more active elderly people contribute to the radio program and thereby motivate the more passive ones to join. Those could probably be found in the first or third group of elderly people receiving home care service.

In my concept, the contributed content can be text messages such as quotes or book passages or a wished song. The technology that makes it possible to participate should again be easily accessible by elderly people. Therefore, I thought of using TV, Teletext or telephone. As the interaction of leaving a voice message is very easy by telephone and in addition something the elderly people are used to, I decided to use a telephone in my design solution.

Leaving a quote or a book passage as a voice message demands preparation. Even if the elderly person has a clear mind and knows which kind of quote she or he wants to leave, she or he has to look it up. Here it would be good if the user had useful literature at home. For a user (e.g. Marie) who is very forgetful, not clear in mind, very passive or not interested in literature, it could be really difficult to contribute to the radio program in this way. An obstacle can also be that a person is afraid of making a mistake while
recording her or his reading (Fig. 22). Therefore, it would be beneficial, if the user had the possibility to re-record the message (Fig. 23). When she or he is done, the user gives a signal, e.g. by pressing a specific number on the phone. This adds more steps in the interaction process and the interaction is maybe unfamiliar compared to the easy way of leaving a message such as on an answering machine. As wishing a song and leaving a message are similar tasks, the interaction should follow the design principle of consistency to be user-friendly (Rogers, Sharp & Preece, 2011). According to Rogers et al. (2011), this principle means “to have similar operations and use similar elements for achieving similar tasks” (p.28). Therefore, it is worth looking into scenarios how to wish a song before deciding about the whole interaction process.

Fig. 22: A contribution to PeerRadio full of reading mistakes
Fig. 23: Re-recording a contribution to PeerRadio

Hilde dials 1 because she wants to leave a recorded message.

A voice explains that she can dial 2 if she wants to re-record the message and when she is done, she has to dial 1.

She reads a poem and makes a lot of mistakes.

She dials 2 for restarting the recording.

This time, she does not make big mistakes.

She is finished with recording and dials 1.

Fig. 24: Wishing a song from the Jukebox-list

Hilde calls the local radio service.

A voice informs her how to proceed.

She dials 2 for wishing a song.

She looks at the Jukebox-list she got from the home care service, which is lying next to her phone.

She dials the number of the chosen song, namely 5 for “For once in my life” by Frank Sinatra.

The voice explains her what she did and how she can proceed now. She hangs up.
In order to wish a song, I first thought of voice control because here the elderly people could wish all kinds of songs they can imagine. When I tested the idea with my mobile phone, a FM transmitter and a radio, the result was disappointing. First of all, it was very difficult to think of the song I want to listen to without any suggestions. Besides that, the voice control system did very often not understand which song I wished. I can imagine that for elderly people who maybe do not have a clear and loud pronunciation, this could be even more frustrating. As it is also very difficult to come up with a song, especially if there is no possibility to look it up online or in the music storage file on the PC, I created scenarios (Fig. 24) in which the elderly persons wish a song from a so called Jukebox-list. This list would be provided by the home care service. The interaction is very easy; the elderly people only have to dial the number of a song they want to listen to. But unfortunately, a printed list is very limited since new songs cannot be added without printing a new list. Maybe especially the persona who only receives services (Hilde) and the persona who still is mentally fit and active (Bengt) would wish to add a song to the Jukebox-list that has a more personal meaning for them, in particular as the function of the PeerRadio is to get to know neighbors by sharing something personal. For example, Bengt who connects memories of dancing with his wife to music, might want to hear a specific song that reminds him of that time. Additionally, there is a risk that the list gets lost and then it becomes impossible to wish a song. An argument against the last concern is that elderly people are used to printed phone books or a list of their friends’ phone numbers. Probably, they also would keep the list close to their telephone that has an assigned place in the apartment. One possibility to make the list more interactive would be to use videotext. But in that case another device comes into play and it would get unclear which device is used for which purpose.

Even if taking part in the program is very easy, it can be difficult for the persona who gets more and more unclear in mind (Marie). In this case a home care service staff can try to activate the elderly person by talking about the Jukebox-list and helping her to wish a song. In the course of time, the neighbors can resume this task. For example the first and the third persona who are still independent to some extent, can ask the forgetful persona about the songs she would like to hear and help her to wish a song.

When the elderly people receive information about the radio program, they also get a hotline for contributing to the radio program. It is the same hotline for both leaving a message and wishing a song. When the elderly user calls the hotline, a voice will greet
her or him and list the options of contribution. The voice also explains which number the user has to dial for choosing one option. In Sweden, elderly people are probably used to this way of interaction as for example a call at the health center follows the same rules. When the user wants to wish a song, she or he has to dial the number of the song that is listed on the printed list. After dialing the number of a song, the user has the option to change the selected song or to additionally leave a message. When she or he chooses to leave a message, a voice explains her or him that she or he now can record. Since the users, who chose the option to leave a message first, should also have the option to wish a song, I decided that the elderly users could dial a number when they are done with the recording (Fig. 23). Consequently, the already mentioned function that the users can rerecord the message is possible.

An important part of the radio program is that the listeners should know who stands behind the contribution they are hearing. A user registration makes this possible. In order to make the registration technically easy and independent from the home care service, my design suggestion is that the answering machine recognizes if the call is not in the database of numbers who take part in the program. In that case the voice will ask the user if she or he is new and explain that after a signal she or he should record a greeting to the radio listeners. This includes that she or he has to introduce her- or himself by only saying her or his name. After this registration, the user can directly take part in the radio program by following the instructions. When the user is calling the next time, the system will re-recognize her or his number. Elderly people who have an anonym phone number have to record a greeting message each time they call. If a user wishes the help of the home care service for the registration process, this should be possible. Especially the users who need a lot of assistance, as one of the personas, are probably dependent on help.

The hotline of PeerRadio could be programmed with PHP. An example for this is an Interactive Voice Response system for a music hotline (Murphy, 2012) that uses PHP code from the service twilio (Twilio, 2015). PHP can also connect to and manipulate the database system MySQL (W3schools, n.d) in order to maintain the lists for the contributors of the radio program and the home care receivers. For example, when a new person registers, the system compares the phone numbers with the numbers of the database list of the home care receivers, and the information of the newly registered user will be saved in a database of participants in the radio program.
5.3.2 Scenarios for the concept PeerLight

Also regarding to PeerLight, the focus of the scenarios is interactions of receiving and sending. As here it is messages that are sent and received, it has to be defined how they look like and how the concept is technically possible.

How to send or receive a message?

In my first everyday scenarios about using PeerLight, the peers could not only send light signals but also voice messages at any time. As the users of the PeerLight do not know each other very well and thus cannot know the PeerLight partner's expectations towards the exchange, it can easily happen that one of them does not meet the other one's prospect. For example if one user puts a lot of effort in it and sends a message to the other person frequently, she or he will wait for a similar answer. At the same time the other user might not want to have such a frequent exchange and might get annoyed. This would be against the principle of reciprocity (see Chapter 4.3.2) which is needed for a satisfying symmetric peer relationship (see Chapter 4.3.2). A solution for this problem could be that the interaction happens at certain times: in the morning after getting up and in the evening before going to bed.

Another problem was to find a convincing design for this kind of interaction. It was difficult to come up with something that would fit in the elderly people's home and thereby be rather accepted by them. On the one hand an abstract design proposal (Fig. 25) seemed to be too modern. On the other hand a speaking lamp seemed to be too unnatural. Therefore I designed scenarios in which greeting only happens by turning the light on and off. When one elderly person gets up, she or he turns on a light and at the same time a light turns on at her or his peer’s home. Her or his peer contact does the same, when she or he gets up. When they go to bed, each of them turns the light off, following the same principle as in the morning.

Fig. 25: Abstract Design of PeerLight
Fig. 26: Rapid prototype – PeerLight 1

Fig. 27: Rapid prototype – PeerLight 2

Fig. 28: Rapid prototype of PeerLight

Click here to see the video documentation:
http://www.franziskatachtler.com/MAHthesis/PeerLight.html
Fig. 29: Misinterpreting the PeerLight message

Fig. 30: Too tired to talk
My idea is that a normal lamp can be used. In one version (Fig. 29), the lamp has two light bulbs. One is turned on by the peer, and the other one is controlled by the user her- or himself and sends signals to the peer's lamp. In the other version (Fig. 30), the user has one lamp which she or he controls and at the same time is connected to a lamp at the peer’s home and another lamp without a switch which is controlled by the peer. The user of PeerLight needs a signal showing the status of the lamp she or he regulates. Therefore the user has two lamps and the one which regulates the lamp at the peer’s home also displays the status of this lamp. The interaction via the lamps is very easy and can be used by all of my personas. It would be useful if the lights did not only differ in having a switch or not, but were also distinguishable by their visual appearance. In my prototype, I used a red and a yellow lamp for each peer; the two yellow lamps are controlled by a button at one peer’s home and the two red lamps by a button at the other peer’s home. For the final design, a visual appearance could be chosen that esthetically fits in the homes. I prototyped the idea with an Arduino Board (Fig. 26, Fig. 27 and Fig. 28). Arduino is an open-source platform which supports interactive projects with both hardware and software solutions. An Arduino Board is a programmable circuit board (Arduino, 2015; SparkFun Electronics, n.d.). In my rapid prototype, I only used one
Arduino to make the concept clear. In real usage, there has to be two Arduinos, which communicate wireless with each other. Arduinos can for example communicate with each other with the help of Radio Frequency (RF) modules (Hobby Robotics, 2009; duinoForProjects, 2013) A newly developed board including a radio module makes wireless communication from an Arduino to sensors in a range of 1 km possible (Flutter Wireless Store, 2015), which would be enough for the neighborhoods in my project.

A problem could be that the forgetful person does not remember turning the light on, but maybe she or he gets reminded if she or he sees the light turned on by the neighbor (Fig. 30). Nevertheless, this group of users cannot properly be a peer care. If something happens to the peer and she or he therefore does not turn the light on, a forgetful person would maybe not realize that. Additionally, there is the risk that the receiver can misinterpret the signal of the light, for example as a sign of availability. In one scenario (Fig. 29) the persona Bengt, who misses to see his neighbors outside in the neighborhood and likes to talk to other people, interprets the switched on lamp as a sign that he can contact his PeerLight partner who in contrast just got up and feels to weak and tired to talk to somebody (Fig. 30). A good example of use is the scenario (Fig. 31) where the users decided that if one of them is leaving home, she or he turns off the light and turns it on again if she or he comes back. Here I was thinking of Bengt who loves to go for a walk but is already a little bit in need of care help. His peer partner can learn to be aware of his routines and, with the help of the light, control if Bengt is back home and safe. Another question is what kind of feeling the receiver perceives by the signal of the light. Without real testing this is difficult to say. For example in Riche et al.’s project (2010), the aim of the clock also was to create a feeling of closeness, but the test persons reported that they mostly got a feeling of being informed better. Nevertheless, when the participators received daily morning messages from their peers, they got a pleasurable feeling (Riche et al., 2010).

5.4 Final concepts

After the validation of my vague concepts of PeerRadio and PeerLight with the help of scenarios, I now concretize them. In the final version of PeerRadio (Fig. 32) (Fig. 34), the program is sent at a certain time because giving continuity and especially a reason to talk are the determining factors for the concept. Additionally, elderly people are used to radio or TV programs being sent at a specific point. For users such as the forgetful
persona Marie, a solution could be a time switch that automatically turns on the radio (Fig. 34). For the contribution (Fig. 32), both ways – recording a message or wishing a song – are worth to offer. In my opinion, the contribution by wishing a song from a printed list is much easier than leaving a message and therefore suitable for the user group represented by Marie. For users, who wish more freedom, the contribution via leaving a message is probably the best solution. They can be creative and also use it for other purposes such as announcing upcoming events they plan to attend. This could for example be the Bingo afternoon, which one of the interviewed elderly man’s neighbors organizes (personal communication, April 29, 2015). Additionally, there is the option that users who want to send a specific song that is missing on the Jukebox-list can record it, even though the sound quality will suffer a little bit in doing so (Fig. 35).

Regarding PeerLight (Fig. 33), the design in which the functions are limited on sending light signals is more convincing. Since a light signal can be interpreted in very different ways (as a sign for everything is okay, being alive, being there or even being available), it is very important to clearly define rules for the interaction (Fig. 36). Otherwise the principal of reciprocity will be disregarded. If both parties decide unanimously to change the rules, this is totally fine though.

Fig. 32: Final Design – PeerRadio
Fig. 33: Final Design – PeerLight

The home care service staff makes breakfast for Marie.

The home care service staff says goodbye to Marie.

Marie continues eating breakfast.

A time switch automatically turns on the PeerRadio.

When the PeerRadio program has just finished, Marie’s phone is ringing.

It is Bengt. He is asking Marie what she thinks about today’s PeerRadio.

Fig. 34: Time switch turns PeerRadio on & successful ticket-to-talk
Fig. 35: Recording a song for the PeerRadio

Bengt calls the PeerRadio hotline because he wants to contribute to the next program.

He records the message, namely a song he used to dance to with his wife.

He is finished with recording and dials 1.

A voice explains that he can dial 2 if he wants to re-record the message and when he is done, he has to dial 1.

In the next PeerRadio program the recorded song is played.

Fig. 36: Motion detector controls Marie’s PeerLight & successful caring

A motion detector turns Marie’s PeerLight on.

Bengt gets up and turns his PeerLight on.

Bengt is eating breakfast. Both light bulbs of his PeerLight are on.

Suddenly, Marie’s light bulb turns off.

Marie is not in her living and dining room. Only Bengt’s PeerLight is on.

As this is unusual for Marie, Bengt is calling her. Marie is more tired than normally, otherwise everything is ok.
All in all, my final concepts offer quite different types of interaction. Whereas the exchanges in the concept PeerLight happen at least twice a day, the radio program is only sent in long time periods, for example weekly. In contrast to the group experience of the PeerRadio (Fig. 32), the PeerLight supports the one-to-one exchange between two peers (Fig. 33). Additionally, the nature of the messages distinguishes: The contributions to PeerRadio are very personal, whereas the light messages in the PeerLight concept are abstract.

6 Conclusion

In the following chapter, I discuss my research and give an outlook to possible future works. First, I reflect how both concepts, PeerRadio and PeerLight, could be an answer to the research questions. Then discuss how they can be modified in the future.

6.1 Discussion

The first research question was which role technology can play for home care receivers in experiencing culture. Inspired by Guldstunder i de äldres vardag, culture was defined as a little moment in everyday life which can be experienced at home and change the perception of the day (see Chapter 4.1). In the case of the concept PeerRadio listening to this program can create this kind of special moment. The idea of the contributions is that they activate the listeners by triggering memories or creating different or new thoughts. In the project Guldstunder i de äldres vardag the little moments that give the elderly people’s lives a meaning are often created by triggering memories for example with the help of old objects (Socialstyrelsen, 2010). According to Hays & Minichiello (2005), music can give elderly people meaning to life and trigger personal memories and feelings. Whether the voice message stimulates the listeners positively, depends on the content of the message. Announcing events cannot create the desired atmosphere. In contrast, a voice reading aloud from a book can evoke a feeling of coziness. An advantage of this concept is that already the radio itself implies a positive atmosphere in the elderly people’s homes. So that also thePeerRadio program creates little special moments, the elderly people themselves have to become active. This means that elderly people like the active man I interviewed have to believe in the idea and feel responsible to maintain the radio. If that works, the realization would be independent of hierarchical structures and the availability of resources, and thereby it would be as sustainable as the interaction
design work Network Zone (see Chapter 2). Also the concept PeerLight technology could be a design answer to the first research question. How a person perceives this and if she or he also gets the feeling that there are peers in the neighborhood who care, is very personal and differs probably a lot from user to user. If the light does not have a meaning for the user, the turned on light probably loses its specialty over time. Nevertheless, if the user tries to get to know the PeerLight partner and thus considers the light as a greeting from a social contact in the neighborhood, this could create a nice interruption in the everyday life. In that case, the idea of greeting by light is a beautiful gesture.

The second question was if it is possible to embed social interactions with peers from the same urban neighborhood in the cultural experience. In the concept of PeerRadio, social interactions are created by the radio program being a ticket-to-talk. The joint activity of listening to the program and the contributions which should trigger memories, thoughts or opinions are a conversation starter. This could maybe be improved if there would be a function to see who of the neighbors is also listening to the radio program in the same moment such as in the work ticket-to-talk-television (see Chapter 2). In the concept of PeerRadio, communicating with each other is supported by the address list which supports two ways of contacting – writing letters or calling each other. If the peers do not know each other that well, writing a letter can be the beginning of a regular exchange between two people (see Chapter 4.3.4). Another argument, why in my opinion social contacts are embedded in the concept, is that the radio is created by elderly people who live in the same neighborhood. If people are interested in taking part and contribute to the program regularly, the radio program itself is a result of social interactions. By contrast, the social interaction in the PeerLight concept is more direct since the peer turns a light on and off at the other one’s home. For the user, it is clear with whom she or he interacts. However, there is not really a conversation opener. Only if something unusual happens, for example that the other person does not get up in the morning, the peer should become active and contact her or his PeerLight partner. In my project more ways of communication would have been possible if I had decided for a design with the feature of sending messages. But the simple light keeps the expected interaction clear (see Chapter 5.3.2).

Comparing the two concepts with focusing on potential user groups, the PeerRadio can easily be applied to other users whereas the PeerLight is especially designed for people who stay at home. Concerning the requirements to design, new meaningful social
contacts among elderly people are possible in the PeerRadio concept as very personal content can be shared. In the PeerLight concept, the meaningfulness is given by caring for each other. In both concepts there is a risk that the principle of reciprocity cannot be fulfilled and that the user gets disappointed. Especially in the usage of PeerRadio, it can easily happen that a participant does not receive back what she or he expects or that some participants do not as much engage in the radio program as others do. In the concept PeerLight, it is clearer what is demanded from the users. I tried to design both concepts so that the users are independent from help. Whereas for using PeerLight no support by the home care service is needed, for the PeerRadio it depends on the user’s abilities. Privacy is a problem in both designs; the user shares personal messages or music in one concept (PeerRadio) and in the other one her or his routines (PeerLight). But both concepts avoid that the user has to expose her- or himself. However, in the case of the PeerLight, the information is only accessible for the PeerLight partner whereas everybody in the neighborhood can listen to the program of the PeerRadio. In PeerLight, it is easy to succeed as the user gets direct feedback to her or his action. In the PeerRadio concept, the user who contributes in the program has to wait until her or his content has been broadcasted. Listening to her or his own voice telling a story might be unfamiliar, but listening to the other contributions and to music possibly creates a positive feeling.

In order to clearly answer the research questions, it would be needed to test the ideas with the potential user groups. Ideally, ethnographic research methods should have been used in a research with elderly people (see Chapter 3.2). At the beginning of my project, it has been shown that it takes a lot of time to establish a trust relationship between elderly users and researchers, and that it is challenging to find the right level of difficulty of tasks for elderly users. This problem could have been solved if I had built on existing structures and collaborated with professionals in elderly care. But also that takes time to establish and needs to be planned in advance. This was not possible in the short scope of time I had for the project. Therefore, my second choice of methods was literary research and scenario-based design (see Chapter 3.3). This was helpful to get an insight in the lives of elderly people who receive home care service and to design for different user situations. But by using this method, it is problematic to definitely answer the research questions as they are about personal perception and what the users make out of the design concepts. Nevertheless, it has shown that already the input by professionals who are working together with elderly people and by the active elderly man with peers who
are potential users of the design was helpful to some extent. If my designed rapid prototypes were partly tested, statements about the perception and how the elderly people would use the design could already be made. By changing methods, I lost valuable time. In a future project in the same field and of the same scope, I would right from the start decide for scenario-based design with rapid prototypes as a result which should be tested partly with elderly people and professionals. The tests should be simplified compared to other user tests and integrated in a dialogue between the researcher and the elderly test person. Even if in that case the outcomes probably are not as fruitful as in a co-design project, I think this is the ideal way of working under the conditions of my project.

### 6.2 Future work

A current development is that among people aged 65 or older the number of persons with Internet access (Smith, 2014) and the usage of social networks is increasing (Duggan, Ellison, Lampe, Lenhart & Madden, 2015). This means the elderly people I designed for will more and more disappear, and as a consequence my concept would have no worth. At the moment, the design of the PeerRadio shows limitations in the interaction, for example that new songs can not be added easily to the Jukebox-list, that the radio program is accessible by anybody in the neighborhood and not only by the community and that it is not visible who is listening. These aspects could easily be solved by using current technologies. I think the idea of sharing music in order to get to know peers endures in the future. For younger generations, there are for example newly developed dating pages with the aim to find your music taste peer (Tastebuds, 2015). A design task for the future could be how to integrate the concept of PeerRadio in a smart home without losing the charm of the analogue radio. It would also be interesting to find a possibility to extend the functions of PeerRadio. So far, the home care service organizes excursions such as theatre visits and thus the elderly people are dependent on them. As the program is about sharing music or literature, PeerRadio makes it possible to find peers with the same cultural interests in the neighborhood. Some of the people might go to the theatre or a music program together. Thus, the functions of PeerRadio would extend in a profitable way by giving elderly people tools for organizing their social activities more independently.
As for the PeerLight, it would be easy to integrate it in smart homes. Here it is important that the lamp does not become sterile and keeps its warm atmosphere. It would be interesting to find a possibility of giving the concept more levels of communication. Additionally, more research could be spent on finding ways to support caring among peers with help of Interaction Design. Just as Riche et al. (2010), I think that this approach is much more fruitful than monitoring systems, especially if the designer keeps the principle of reciprocity in mind. A future task could be finding a possibility to make the environmental clues more visible for a bigger group of elderly people and not only in a one-to-one-interaction.

As mentioned, it was not possible to collaborate with professionals in the home care service. This demonstrates how stressed the staff is. Even if there already are computer systems that help to schedule their working time, their working conditions could be improved with the help of further interaction design solution. Therefore it would be worth to invest more research in problems in the home care service work structures. Reciprocally, the design proposal PeerRadio could benefit from a more relaxed home care staff since especially users who need a lot of assistance (e.g. Marie) are dependent of help to use it.

Another future service-oriented research could be to find a way of improving the collaboration between home care service and meeting places (see Chapter 4.1.3). I can imagine that there is also an interest in that among the home care service staff. A in my opinion very challenging problem is that there probably are elderly people who do not receive home care service and also are not in contact with meeting places, but feel lonely. Could it be possible that a local radio program reaches out to them? In order to make this possible, a method has to be found how they get to know about the existence of the radio program. Harley's (2006) statement that the social isolation happens before elderly people need assistive living strengthens that there is more research needed here.

All in all, the concept PeerRadio has more functions and can be extended in more different ways in the future compared to PeerLight. By contrast, the concept PeerLight emphasizes the idea of caring and making neighbors and their activities visible. Here it would be interesting to find further design concepts, which keep the simplicity of the proposal but add more possibilities.
References


Perez/publication/227184973_Ageing_in_Place_Predictors_of_the_Residential_Satisfaction_of_Elderly
/links/00b7d518ce1a9316d000000.pdf


Romero, Natalie, Sturm, Janienke, Bekker, Tilde, de Valk, Linda, & Kruitwagen, Sander (2010). Playful persuasion to support older adults’ social and physical activities. *Interacting with Computers, 22*(6), 485-495. doi:10.1016/j.intcom.2010.08.006


List of Figures

Fig. 1 (p. 8): Super Dots Workshop. Source: http://old.karch.dk/Minddesign_dk/Materiale/Mind+Design/No+41/MD%2341-Forskning_i_god-Superprikker-409x262.jpg. By permission of the copyright owner (Senior:Interaction)

Fig. 2 (p.8): Network Zone activity in an urban park. Source: http://4.bp.blogspot.com/-oBF1gbFpfCg/TpsYQ53b2NI/AAAAAAAAAHo/HX9gGqA_vj0/s1600/ultimate.jpg. By permission of the copyright owner (Senior:Interaction)

Fig. 3 (p.8): Physical manifestations of Network Zone 1. Source: http://1.bp.blogspot.com/-ugVOEPXndP0/TqP6iMr7kdl/AAAAAAAACUc/SJFEOSfZJUc/s1600/bygge47.jpg. By permission of the copyright owner (Senior:Interaction)

Fig. 4 (p.8): Physical manifestations of Network Zone 1. Source: http://3.bp.blogspot.com/-Ucf9w4zh_b8/TqLoMYEfjnI/AAAAAAAASw/BUqqZvvlpqA/s1600/bygge56.jpg. By permission of the copyright owner (Senior:Interaction)

Fig. 5 (p.9): markerClock. Source: http://yannriche.com/markerclock.php. By permission of the copyright owner (Yann Riche)

Fig. 6 (p.9): Display of markerClock. Source: http://yannriche.com/images/apercu_horloge.jpg. By permission of the copyright owner (Yann Riche)

Fig. 7 (p.14): Relevanta bekanta 1. Source: Stephanie Wihlborg, Relevanta Bekanta. By permission of the copyright owner (Relevanta Bekanta)

Fig. 8 (p.14): Relevanta bekanta 2. Source: Stephanie Wihlborg, Relevanta Bekanta. By permission of the copyright owner (Relevanta Bekanta)

Fig. 9 (p.16): Guldstunder i de äldres vardag 1. Photo: Arvi Kaaman. Source: Irmeli Dahlbacka, Guldstunder i de äldres vardag. By permission of the copyright owner (Guldstunder i de äldres vardag)

Fig. 10 (p.14): Guldstunder i de äldres vardag 2, Arvi Kaaman. Photo: Arvi Kaaman. Source: Irmeli Dahlbacka, Guldstunder i de äldres vardag. By permission of the copyright owner (Guldstunder i de äldres vardag)

Fig. 11 (p.11): Cultural Probes – one package

Fig. 12 (p.12): Cultural Probes – tasks

Fig. 13 (p.13): Cultural Probes – diary

Fig. 14 (p.27): Persona 1 – Hilde

Fig. 15 (p.27): Persona 2 – Marie

Fig. 16 (p.28): Persona 3 – Bengt

Fig. 17 (p.32): Rapid prototype of PeerRadio. Click here to see the video documentation: http://www.franziskatachtler.com/MAHthesis/PeerRadio.html
Fig. 18 (p.32): Marie forgets to turn PeerRadio on.

Fig. 19 (p.33): The home care service turns PeerRadio on.

Fig. 20 (p.33): Missing the beginning of PeerRadio

Fig. 21 (p.34): Unsuccessful Ticket-to-talk

Fig. 22 (p.36): A contribution to PeerRadio full of reading mistakes

Fig. 23 (p.37): Re-recording a contribution to PeerRadio

Fig. 24 (p.37): Wishing a song from the Jukebox-List

Fig. 25 (p.40): Abstract Design of PeerLight

Fig. 26 (p.41): Rapid prototype – PeerLight 1

Fig. 27 (p.41): Rapid prototype – PeerLight 2

Fig. 28 (p.41): Rapid prototype of PeerLight. Click here to see the video documentation:
 http://www.franziskatachtler.com/MAHthesis/PeerLight.html

Fig. 29 (p.42): Misinterpreting the PeerLight message

Fig. 30: (p.42): Too tired to talk

Fig. 31 (p.43): Usage of PeerLight

Fig. 32 (p.45): Final Design – PeerRadio

Fig. 33 (p.46): Final Design – PeerLight

Fig. 34 (p.46): Time switch turns PeerRadio on & successful ticket-to-talk

Fig. 35 (p.47): Recording a song for the PeerRadio

Fig. 36 (p.47): Motion detector controls Marie’s PeerLight & successful caring