

My City Counselor: Enhancing Social Interactions of the Elderly

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Abstract

This thesis presents the design of an interactive tool to improve elders' social interactions. First, we studied the social interactions of the elderly. These interactions often diminish as elders experience dynamic physical, social, and cognitive decline. We examined how technology might extend these diminishing social interactions. We looked for the ways to minimize the technological barriers faced by the elderly in order to more easily integrate the technology into their lives.

The final design focused on social interaction through travel and knowledge of a place. It is a service called 'My City Counselor', which allows elders to share their knowledge about local places they know well. This tool is designed to support the elderly in building new relationships or in maintaining close existing relationships by providing useful local information or by sharing common memories.

Introduction

The elderly population continues to grow rapidly in the U.S. Statistics show that by the year 2025, 20 percent of the population will be over the age of 65. Additional research shows that social relationships are a principal contributing factor to quality of life for the elderly (Gabriel et al., 2004). As elders age, they experience dynamic physical, social, and cognitive decline which fundamentally reduces their opportunities for social interaction. The need for enhancing social interaction will be one of the biggest, since there is a greater possibility for seniors to be socially isolated because of physical and mental decline as people age.

Product and service design has yet to respond to these needs. One reason may be a stigma against trying new technology for this population, and the realities of deploying it in the settings where elders live (Lindley et al., 2008). Dorfman's work focused on the values and relationships that are important to elders (Dorfman, 1994). Our contextual research examining products for elders revealed that many products developed for elders lack a deep understanding of the values and relationships that Dorfman found to

be important. Common mistakes include focusing too much on the external experience of aging, various physical impairments, and regarding elders as passive subjects.

In this work, we aimed to enhance the social interactions of the elderly since we believe social interactions are critical for positive inner experience of aging. In order to design for social aspects, we examined the needs, values, and social relationships of the elderly.

Related Literature/Projects

The related research about elders and their social needs ranges over multiple disciplines, from sociology and psychology to design and HCI. Sociology and psychology provides knowledge about the characteristics of social relationships and their effects on elders' mental and physical health. In HCI and design, the focus has been mainly on how technology can assist elders' as they age and decline. Other studies focused on multi-generational relationships.

1. Social relationships and quality of life

Social relationships and quality of life are closely interconnected. Quality of life is highly subjective, since everyone has different criteria to judge and is in a different situation. However, research shows that the social relationships are one of the key factors that determine how people feel about their lives and themselves.

According to (Hirsch et al, 2000), two factors mainly affect the quality of life: independence and engagement. 'Independence' is the capacity to care for oneself and to make one's own decisions and 'engagement' is connectedness to the world and to other people. Although those two factors are defined differently depending on individuals' expectations, the balance between two is highly related to quality of life for elders. Additionally, interviews with older people in another study suggested that 'access to significant relations' is one of four important factors contributing to quality of life (Borglin et al., 2005).

2. Values and aspirations

Dorfman categorized elders' aspirations using five key values: autonomy, personal growth, pleasure, social ties, and helping. Dorfman stayed in a retirement community called Franklin Village for three months and observed and interviewed the elderly residents during her stay. According to her research, the value 'autonomy' implies physical and mental health, independence, and even a good death. The aspirations related to personal growth are desires for spiritual and intellectual self-improvement. Helping is defined as affecting social change and helping others. Social ties, meaning well-being of family and friends, is the another value, as well as pleasure, which means activities, creative works, etc. Besides the value of 'social ties', other values are also related to social

interactions (figure 1).

3. Values and Needs

Maslow proposed a theory of a hierarchy of needs in 1943. In his theory, the hierarchy of needs contains five layers of humans' needs, from the most fundamental physiological need at the bottom to the self-actualizing need at the top. Maslow argues that lower needs must be prioritized, so if a person has physiological needs such as starvation, higher needs cannot be met.

Maslow's Hierarchy of Needs (figure 2) reveals three needs that closely align with Dorfman's: self-actualization, esteem, and love and belongingness. However, as people get older, their physical or safety needs increase and sometimes precede other higher needs that people used to pursue before. Being unable to pursue the values people have may cause frustration or depression for the elderly. In Dorfman's study, good health is highly valued among the residents since they understand it is the precondition for pursuing another values (Dorfman, 1994).

For designing a senior product, we believe that it is necessary to understand this conflict between the increasing fundamental needs and a desire to keep pursuing the higher needs (figure 3). The product should support the elders' physical or safety needs, and at the same time, help elders to pursue the higher needs as they used to do.

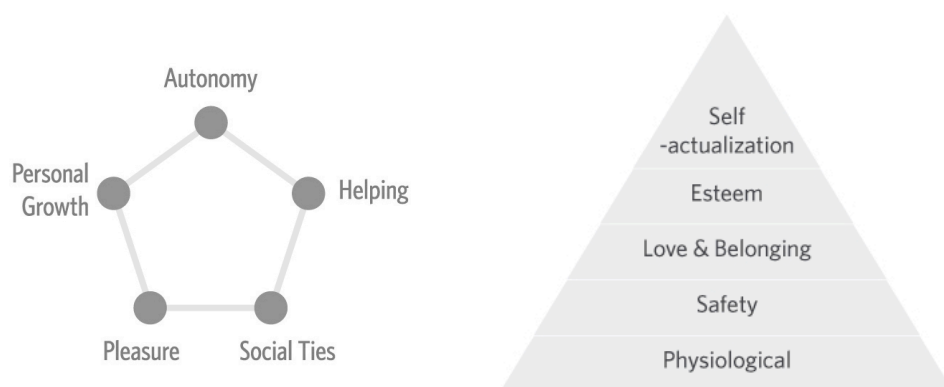


Figure 1 Values in later life (left, Lee, Y. 2011)

Figure 2 Maslow's Need Hierarchy (right, Maslow, A. 1968, 1970)

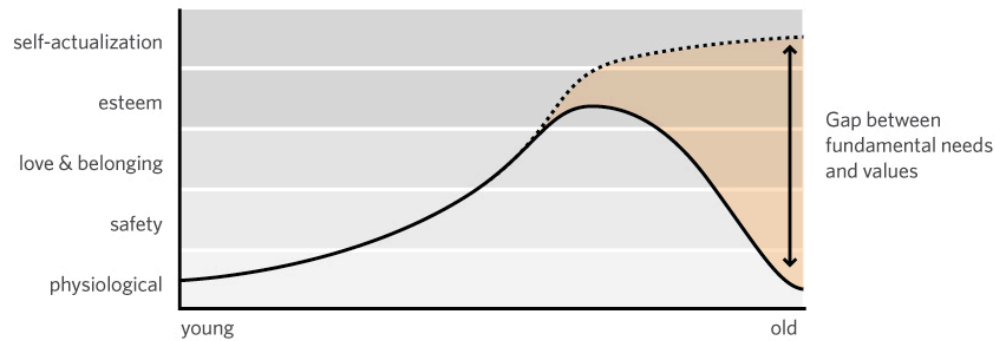


Figure 3 Gap between 'what elders want' and 'what elders need' (Lee, Y. 2011)

4. Motivation changes

As people grow older, the goals and motivations for social interaction change. Elders prefer to invest in relationships that are emotionally rewarding to them (Lindley et al., 2008). Carstensen et al. explains this phenomenon through socioemotional selectivity theory, which maintains that motivation for social interaction shifts from expansive goals to goals related to feelings as people realize their time is limited. Since the future is less relevant for them, elders seek emotionally meaningful relationships, rather than making new ones. Also, they reduce less important relationships. For this reason, elders have smaller social networks and become more positive about their relationships than younger people (Carstensen et al., 2003) and the number of close relationships within social networks remains stable until very old age (Due et al., 1999).

However, Fredrickson et al. show an interesting finding when people were asked to imagine that they could extend their life span by 20 years. Participants showed an increased preference for new social partners (Fredrickson et al., 1990). We think this finding implies new possibilities for products and services to support social interaction in the elderly population, since people are living longer and may want to explore new relationships.

5. Social interactions of elders

The field of gerontology has provided many studies on aging and changes in social interactions of elders, including family, friends, peer groups, housing service providers, neighbors, caregivers, medical service providers, and others. Some studies have focused on interactions within family, especially intergenerational communications. Research has shown that there are differences between peer interactions and intergenerational interactions, for example in responsibility and social propriety (Lindley et al., 2008). Understanding the differences and the characteristics of each social interaction that an elder maintains is critical for design.

Figure 4 shows the five values and the social interactions of the elderly. In close social interactions, it is divided into two interactions: peer interactions and intergenerational interactions. Reciprocity is necessary for peer interactions, with a spouse or confidants. However, for intergenerational interactions, such as with children or grandchildren, the relations are rather asymmetry and reciprocity is not expected as much as it is for peer interactions. This difference can be understood with the values of the elderly. Autonomy is the most common value elders pursue, but getting help from their children or grandchildren might hurt the sense of autonomy.

Values and Social interactions In later life

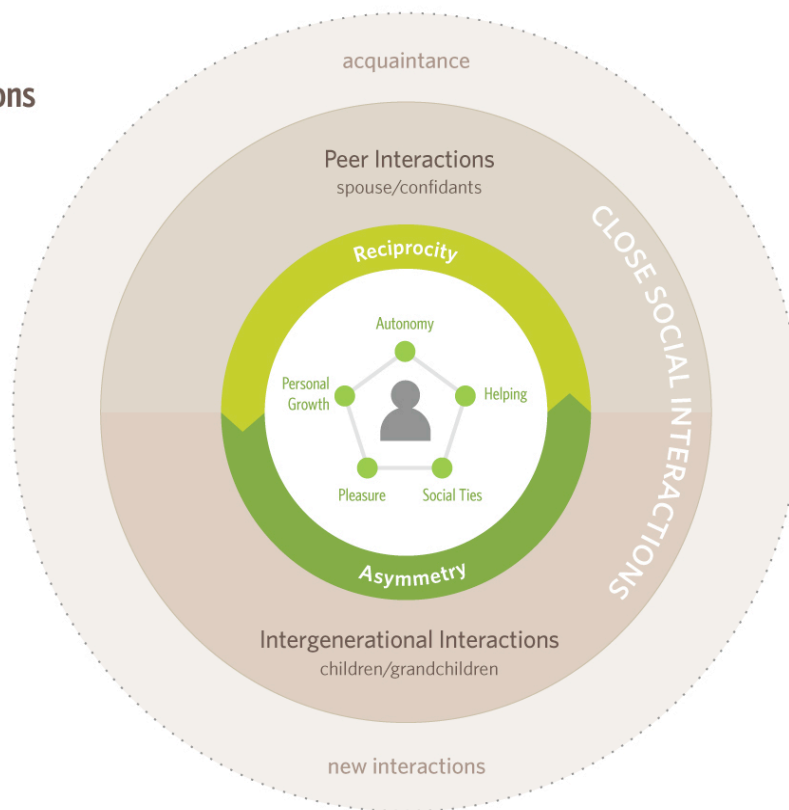


Figure 4 Values and social interactions in later life (Lee, Y. 2011)

5.1. Intergenerational interactions

Reciprocity in intergenerational interactions, family interactions in particular, is unique. This is due to shift of roles between older parents and their adult children. When children are young, parents are expected to look after them; however, when parents grow old, children become the caretakers. Receiving care as an elder can affect one's sense of autonomy and independence. Spitze et al. found that their elder interview participants wanted to remain independence but also hoped that children's help would be available if needed (Spitze et al., 2004).

5.2. Peer interactions

Long-standing friendships help to preserve one's self-image, whereas new friendships are more for personal growth; they help to try out 'a new way of being' (Dorfman, 1994). Fiori et al. points out that friendship may be more influential on wellbeing than family interactions. Since friendship is optional while family interactions are obligatory, friendship is important for feelings of autonomy. Friendships are critical for community acceptance, societal integration, and feelings of intimacy and companionship (Fiori et al., 2006).

6. Designing for elders' social interactions

A variety of design explorations have proposed how new technologies might be designed to support intergenerational and peer interactions; the focus has been mainly on intergenerational ones.

6.1. Designing for intergenerational interactions

Designing to enhance communication between family members living apart has been a popular design topic for many researchers. Itoh et al. developed the Family Planter system (FP) based on the concept called 'Tsunagari' communication, which is sharing the implicit cue information such as person's mood or presence everyday. FP detects cue information with sensors and transmits it to the other family member through rotating, shining optical fibers of a planter. A field study of FP revealed that participants' family interactions were somewhat enhanced (Itoh et al., 2002). The Hug, developed by Gemperle et al., explores more direct and physical interaction for a remote family. The Hug is a soft robot with wireless telephony and pressure sensors that facilitate remote voice and tactile communication (Gemperle et al., 2003).

Other researchers have designed sharing information system for a remote family. Digital Family Portraits (DFP) (Mynatt et al., 2001) uses a dynamic picture frame to visualize seniors' daily lives, and promotes 'peace of mind' for extended family members. Icons are updated daily on the frame conveying information sensed about health, environment, relationships, activity, and events. Another similar design project is Shared Family Calendars (SFC) by Plaisant et al. SFC is a system of sharing calendar information by entering into a computerized calendar or writing by hand on digital paper calendars (Plaisant et al., 2006).

Other researchers have developed physical games for grandparents and grandchildren. Virtual Box (Davis et al., 2007) mediates intimacy through virtual and physical play. (Khoo et al., 2006) also developed an interactive social-physical game called Age Invaders. The Magic Box (Vetere et al., 2009) is another example of an interactive game, but it's specifically designed for families separated by distance.

Many researches have suggested systems that elders are cared or monitored by other family members so that they can make sure the elders are well. As we learned from the study about elders' needs and values, however, this kind of systems have a risk to hurt the sense of autonomy and independence of the elderly. We see the opportunities that the elderly plays a role as a caregiver to other family members in reverse; it fits to the fact that elders value helping and family ties. Also, the elderly could play the same role to young members in a larger society. This aspect does not seem to be explored much yet in a design community. We only could find a few studies including Palaver Tree Online (Ellis et al., 2001), which is 'an online community that supports kids interviewing elders to build up a shared database of oral history'. We think there is a great potential for extending the elders' social interactions.

6.2. Designing for peer interactions

Some research has attempted to increase more social interaction between elders and their peers. DanceAlong project (Keyani et al., 2005) is an augmented dancing environment that provides elders opportunities for entertainment and exercise. Kidd et al. created a sociable robot, Paro, to encourage social interactions among elders (Kidd et al., 2006). MarkerClock (Riche et al., 2007) is a clock that visualizes the routines of friends, neighbors, and relatives.

Design Process/Approach

Based on our literature review, we set the following design goals for this project:

- to understand the dynamic changes in elders' social interactions;
- to find the most suitable and effective way that the current or near future technology can mitigate these changes;
- to prototype a future state suggesting how new products and services might extend and enrich social interaction for this group.

In order to achieve these goals, it was critical to collaborate with the target group throughout the entire design process.

The design process consisted of four phases:

- an exploratory phase, where Initial interviews and site visits were conducted with elderly members and staff from the Osher Lifelong Learning Institute at CMU and the Oasis center in Pittsburgh.
- a generative phase, where data was analyzed and synthesized and eleven initial design concepts were developed and tested.
- an iterative phase, where concepts were elaborated, and additional concepts, personas, and scenarios were developed.

- a refinement phase, where three speeddating sessions were conducted, and one design concept was selected to prototype based on participant feedback.

** IRB protocol number: HS10-472*

Research/Exploration

One assumption of the study was that elders want to be actively engaged in their social connections and in their activities. Also, we assumed that lack of opportunities to find people who can join together is one of the main barriers that prevent elders from participating in activities. If elders can use technology to interact with other peers, friends, or family, they might be able to pursue what they want to do more easily. However, we understood that the motivation or the goal to use this service would vary depending on an individual's needs. For instance, if the person is interested in learning new knowledge such as foreign languages, (s)he will be more open to new relationships with people with common interests. On the other hand, if the person is more interested in maintaining long-distance relationships with his or her friends, (s)he will need a tool that can connect with friends easily and effectively.

Qualitative interviews

We recruited nine elders aged between 65 and 90 from the Osher Lifelong Learning Institute. The participants consisted of five females and four males and we conducted the interviews with each individually except for two couples. Each interview lasted about an hour and we asked about their background, daily life and activities, relationships, and the usage of technology or products.

The Osher Lifelong Learning Institute is an organization that offers classes in various subject matters for senior citizens. Members pay a fee every year to maintain their membership and they pay tuition to take courses. A typical Osher student is highly educated, does not have serious mobility issues, and is generally financially stable. We understood that our participants were not the average senior population and wanted to discover which factors make them active and what kinds of difficulties they have.

Findings from qualitative interviews

Each participant was unique in background and the day-to-day experiences they relayed. Some lived with their spouses, some were unmarried, widowed, or divorced, and lived alone. Some had very strong family ties with their children and grandchildren, whereas some others spent most of their time pursuing activities for pleasure. In terms of Dorfman's five values of elders, everyone pursued different and multiple values.

For instance, Harold, 90, lived with his wife and played tennis three times a week with his friends. He was in charge of organizing day trips at Osher, and he also organized annual family gatherings every year. He seemed to enjoy his responsibilities and the

various social relationships he had. He said he felt very lucky since he didn't need to use a walker or cane. For him, autonomy and social ties seemed the most important values.

Anna, 71, was divorced and lived by herself. She used to be a graphic designer and enjoyed plein air painting, joining workshops for opportunities for practice. Also, she loved swing dance, often attending on Sunday nights. In the past three years, she had used online match websites to find a dating partner. For Anna, pleasure seemed the values she wanted to pursue the most.

Even though participants had differences, commonalities also existed. Being independent and active was the value everyone shared. Participants seemed to try hard to keep themselves busy and healthy by committing multiple activities, exercising regularly, traveling, etc. Also, many participants wanted to provide valuable help to society. Some had volunteered for local schools or nursing homes. Some people thought participating for our study was one way to contribute and help future generations.

The use of technology varied for each participant. All the participants, except for one who was blind, used email with family or friends, but many participants seemed to be rather intimidated about using new technology. One participant said she "felt like a dinosaur for not using a computer", so she was taking one-to-one computer lesson at an Apple store. A few used Facebook to communicate with their family. However, their usage of Facebook seemed rather limited because they cared about privacy issues a lot or their young family members were reluctant to communicate actively.

We learned from our interviews that elders had strong and long lasting relationships with either family or friends, that spawned a variety of memories. We conducted one contextual interview to understand how elders archive things from the past events and what the actual environment of using technology is like. Doris, 65, was unmarried and lived alone. She was a part of a big Italian community and lived in the same neighborhood as several family members. At her house, she gave us a house tour, then showed us her laptop, iPod, and TV. In particular, we observed how she used email, Facebook, and other websites to communicate with people.

Doris had many family photos throughout the house, along with many photo albums. Albums took the form of collections of photos from one event, such as a summer vacation, Thanksgiving day, etc. She was trying to digitize all the analog photos she had and share them with family.

We also visited the Oasis local center in Pittsburgh, taking a tour at the center and interviewing two staff members. Staff emphasized the ownership that their members have to make changes to the curriculum as they see fit. For computer classes, an instructor is required to be very patient. The language used related to computer should be really easy. There are two main motivations to learn computer: communication with

family and online shopping.

Design opportunity areas

We found six opportunity areas based on our research: supporting self-reflection, helping to recollect the past and to archive the present, providing opportunities to actively involve in a society, supporting to learn, helping to keep connected with family, friends, and communities, and helping to building new relationship.

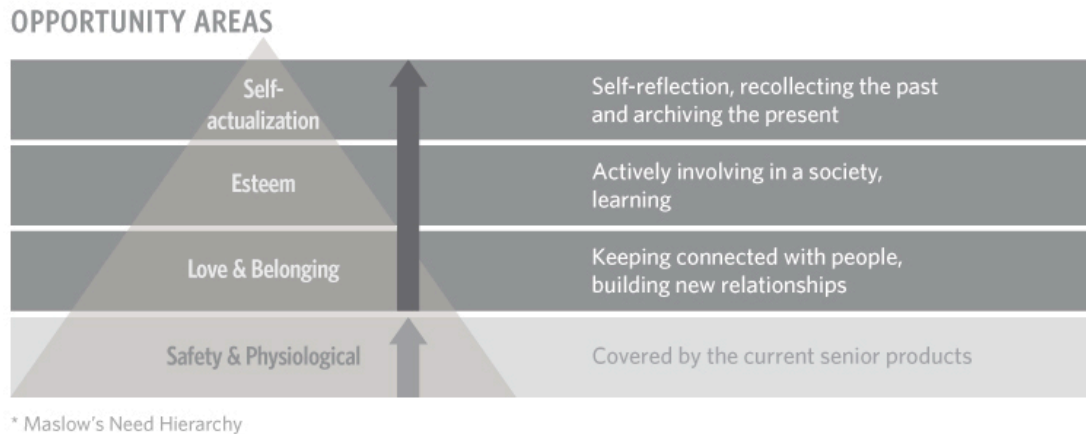


Figure 5 Opportunity areas (Lee, Y. 2011)

Prototypes/Evaluations

Developing Initial design concepts

We developed initial design concepts for each opportunity area:

11 design concepts (figure 6)

1. Meeting a partner or friends: a system suggests social partners based on a person's location, age, interest, background, etc.
2. Exercising together: a system suggests people who can exercise together, then, recommend types of exercising based on the group members' condition or the weather. Also, the system monitors the progress of exercising and encourages the group to exercise regularly.
3. An event calendar: a system provides information about local events and discounted prices, and also, it helps users find people to go to the events together.
4. Sharing the memories of deceased spouse: a user can create a page of his/her deceased spouse and add photos or stories related to the person. Also, the user can share the page with other people.
5. Sharing volunteering information: people can share information or their experience about volunteering opportunities.
6. Having a class at home: a user can organize classes at his/her home with other people in neighborhood.

7. Having a class at home taught by your classmate: it is a kind of a volunteering system that one person in a class visits the home of someone who has a mobility issue and teaches on behalf.
8. Taking online classes: a user can take online or offline class in parallel depending on his/her condition of a day.
9. Archiving annual family tradition: a user can easily create a page for each family event every year and share it with other family members.
10. Sharing stories about belongings: a user can create pages about belongings and add photos or stories about the object and share with family or friends.
11. Writing autobiography: a user can write an autobiography and share it.

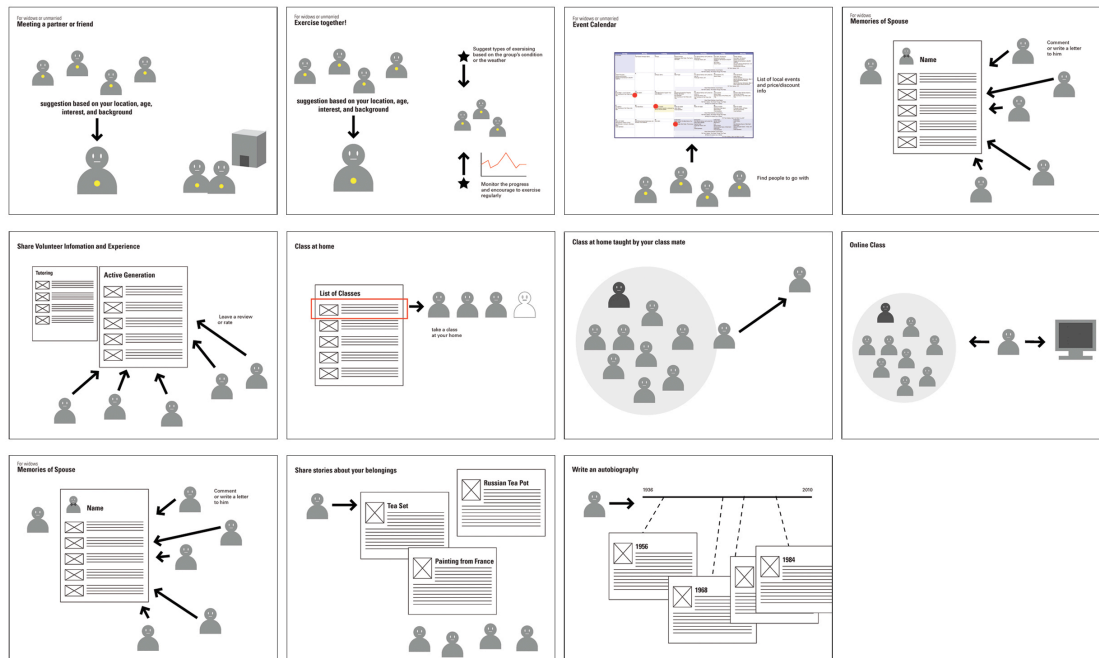


Figure 6 Initial concept sketches (Lee, Y. 2011)

First informal speeddating and findings

We conducted an informal speeddating session with a couple. Speeddating is a rapid concept evaluation method where participants read, review, or act out future design scenarios (Davidoff et al, 2007). Participants particularly liked concept 4, 10, 11, which they can reminisce about the past. Also, concepts for communication with family members were preferred. There was a concern about privacy issue of meeting new people through online or sharing personal information.

Developed a persona

We developed initial personas: Linda (a grandmother), Richard (her deceased husband), Kelly (Linda's granddaughter), Paul (Linda's son), Shannon (Linda's daughter), Robert and Ruth (Linda's friends), George and Jane (strangers).

6 design concepts

Based on the initial concepts and feedback from the speeddating, we developed six design concepts with more detailed scenario.



Figure 7 Concept 1 storyboard (Lee, Y. 2011)

Concept 1. Travelling where my granddaughter travels (figure 7)

1) Kelly is travelling to Japan for two weeks this summer with her friends. Linda hasn't been to Japan, but always wanted to go. Kelly lets Linda know that she is visiting southern Japan. 2) Linda finds some documentaries, movies, and TV shows about the cities where Kelly is going to visit. 3) Linda starts watching a documentary film about temples in Japan. She sees a beautiful temple in Kyoto and thinks Kelly would be interested in visiting there. 4) Linda sends information about the temple to Kelly (photos, location, hours, etc.). Kelly receives the information and decides to visit the temple! She adds it to her itinerary. 5) During Kelly's journey, Linda can sync to Kelly's itinerary from home. Every morning, Linda can see which city Kelly is in. Today, Kelly is in Kyoto. Linda checks the weather of the city. Kyoto seems sunny and warm today. 6) Linda remembers the temple there. She watches the documentary again while having breakfast. She wonders if Kelly is having a good time there. 7) Just then, Kelly calls Linda and shares some photos that she took at the temple. 8) Kelly looks really excited and happy in the photos and Linda is so glad that she recommended the place to Kelly.



Figure 8 Concept 2 storyboard (Lee, Y. 2011)

Concept 2. Being connected with my son's city (figure 8)

1) Paul's family just moved to Houston. Linda hasn't been there. She'd like to know what the city is like, but she won't be able to visit any time soon because her arthritis has been getting worse. 2) Linda adds Houston to her favorite cities. She gets updated about local news, photos, weather, etc., in real time. 3) She wants to know more about the city. There is a list of recommended virtual city tours created by local experts. She chooses one of them and starts to watch it. 4) The tour with the expert's guide is really interesting. She discovers the expert, George, lives in the same area as Paul. 5) Paul is having a hard time getting used to Houston, so Linda thinks George can give Paul some useful local information. She recommends George to Paul. 6) Paul contacts George, and George provides information about local markets, restaurants, etc.



Figure 9 Concept 3 storyboard (Lee, Y. 2011)

Concept 3. Reminiscing about my past trips (figure 9)

1) Linda travelled the West Coast with Richard, her husband, in 1995. Shannon lived in San Francisco at that time, and they had a great time together. 2) Linda watches a slide show of her photos in SF. She shares some photos she took with Shannon. 3) Linda and

Shannon start talking about the trips and memories they had with Richard. They search through all their photos of Richard and create a photo collage with them. 4) Linda shares the photos of Richard with other family members. Other people add photos they have.



Figure 10 Concept 4 storyboard (Lee, Y. 2011)

Concept 4. Reminiscing about trips with friends (figure 10)

1) Robert, Ruth, and Linda are meeting at a senior center. They're talking about cities they've travelled to and want to see if they've been to some of the same cities. 2) They find out they have eight cities in common. They are shown some landmarks the all three of them visited. 3) They see a photo taken at a park in Rome. They wonder how the park has been changed since they've been there. 4) They compare their own photos to some more recent photos of the park.

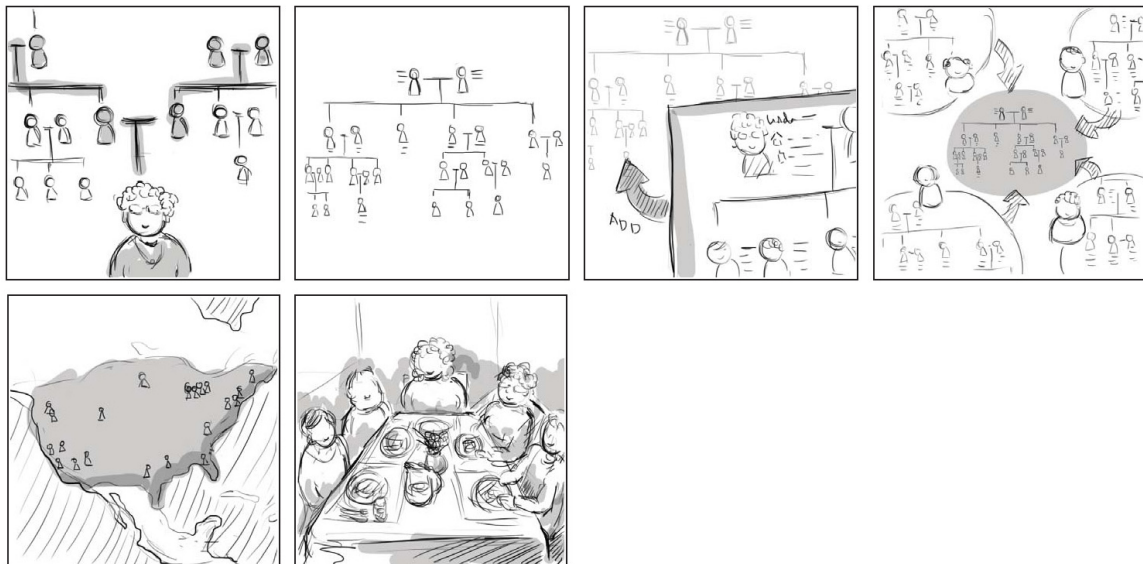


Figure 11 Concept 5 storyboard (Lee, Y. 2011)

Concept 5. Building a family tree (figure 11)

1) Linda still keeps in touch with family on her mother's side, but lost contact with most people on her father's side. 2) She draws a family tree with as many names as she knows. She searches for people who might be part of her family and send them

invitations to join her tree. 3) She adds her own family and their contact and location info on the tree so that other family members can see it. 4) As family members receive her invitation, sign on, and add other family members they know, the family tree gets filled in and expanded. 5) With the family tree, Linda can search family members by the city they live in. 6) She discovers that there is a cousin on her father's side near her town! She contacts him and invites him to dinner.

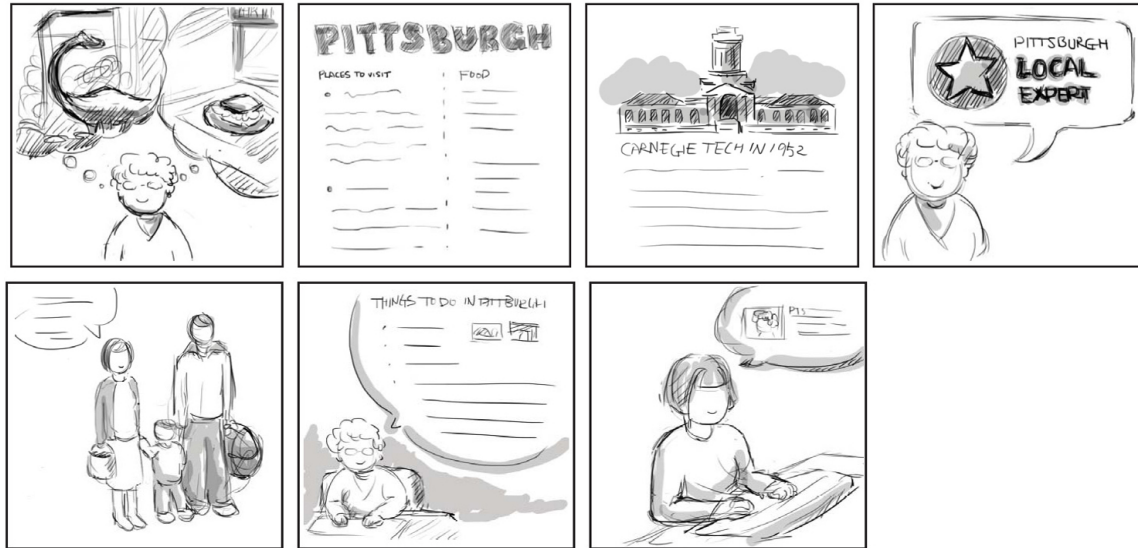


Figure 12 Concept 6 storyboard (Lee, Y. 2011)

Concept 6. Being an expert of my city (figure 12)

1) Linda has lived in Pittsburgh for her entire life. She thinks Pittsburgh is a beautiful and interesting city with many attractions that people don't know about. 2) She starts writing some suggestions about food, places, and activities in Pittsburgh for visitors and new residents. 3) Also, she writes historical stories. One of her most popular stories is about the time she spent at CMU when it was still Carnegie Tech. 4) As her suggestions and stories become more popular with visitors, she gets the title 'expert of Pittsburgh'. 5) One day, she receives a message from Jane, a lady in Boston. Jane says she is going to travel Pittsburgh with her family for three days next month and asks Linda to recommend some places to visit. 6) Linda makes a list of things that Jane can do with her five-year-old son. 7) Jane has a great time in Pittsburgh with Linda's guide. After her trip, Jane writes a review and recommends Linda's guide to other people.

Second round of speeddating

For the next concept evaluation session, we recruited two couples and a single woman, all of whom had children and grandchildren. We showed a map of personas and scenarios and told the stories at the same time. We asked feedback after each scenario. Responses varied depending on each participant's situation. For example, for concept 1 and 2, the relationship with children and grandchildren affected participants' feedback.

A couple who interacted with their offspring very often didn't think they would use such a product, since it might be 'too much' intrusion for their children or grandchildren. On the other hand, the other couple, who didn't talk with their grandchildren so frequently, thought it would be a great way to initiate communication. There was one response saying that it could be depressing for Linda to travel through Kelly's eyes because that might remind Linda about her immobility. For the third concept, 'reminiscing about my past trips', participants thought the similar services were already existing, such as Facebook or Flickr. Some participants liked the fourth concept, 'reminiscing about trips with friends', because it can provide initial ideas to talk about with friends. Participants showed concerns about privacy issues about the fifth concept, 'building a family tree'. One participant said she wouldn't fully trust if the person is her family or not unless there's a reliable system to verify people's identification. The last concept, 'being an expert of my city', was the most popular concept among participants. A participant was bringing some maps all the time with her for the case someone asks her way, and she said she would definitely use the service. Participants liked the idea of getting a title 'expert' and said it would motivate people to use.

Final Design

The final design is a service called 'My City Counselor'. The elderly can share their knowledge about local places with people who need the information, such as visitors, new residents, and also share personal memories related to the places with family or friends.

System maps

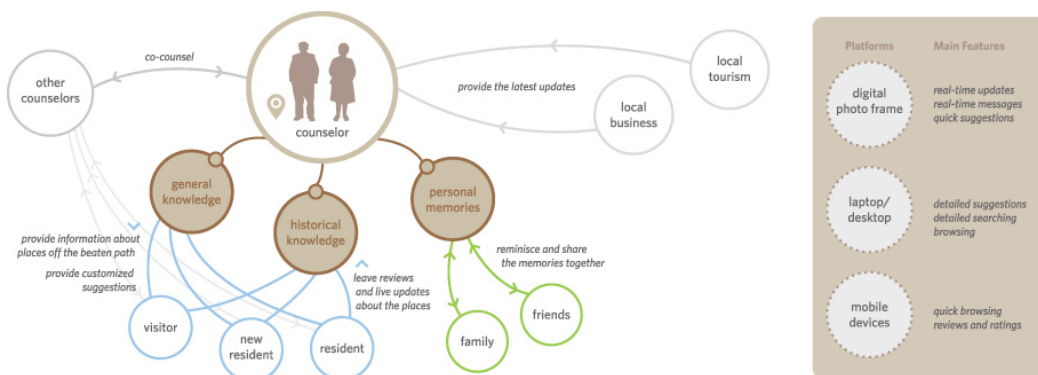


Figure 13 'My City Counselor' system map (Lee, Y. 2011)

We considered three types of information that elders can provide about local places: general knowledge, historical knowledge, and personal memories. With the information, elders can interact with different people. Also, the interaction between elderly users was considered importantly.

We called the users who can provide information ‘counselors’ and the other users who need the information ‘counselees’. Counselors can create a private page for specific counselees and provide personalized information for them. We expected that elders would feel helping other people and being connected with people and places, and then eventually, they would feel they are contributing to society.

Persona

The main character is a 78-year-old woman, Linda Bennett, who was widowed three years ago. She was born in Pittsburgh and has lived there for her whole life. She had been a housewife and has a strong family tie with her children. She tries to be active and positive, in general, she is happy with her life.

Her activities and difficulties: Linda has arthritis of the knee and has trouble keeping her balance so she uses a walker or cane outside. She used to travel a lot with her husband after his retirement and used to visit her children often. Now she sometimes joins a day-trip offered by a senior center, but rarely travels long-distance any more; it is too challenging to travel by herself. She loves playing cards, going to the opera or classical music performances, and volunteering at the local school; she used to do these regularly, but now, she does much less. She still drives sometimes, but doesn’t drive when it’s dark, because of bad eyesight.

Her goals: She wants to remain independent and enjoy her life. She hopes to keep connected with people and stay positive. Also, she wants to keep doing activities she loves and feel that she is needed by someone.

Scenario

- 1) One day, Linda gets a call from Jane, her old friend in Ohio. Jane says that Julie, her granddaughter, will be attending CMU in the fall, and asks Linda to help Julie settle in Pittsburgh. As a freshman, it’s Julie’s first time living in a new city by herself. Linda would like to help, but unfortunately, her arthritis is getting worse, so she hardly goes outside by herself anymore.
- 2) When Julie arrives in Pittsburgh, Linda calls Julie to say hello and introduce herself in person. Linda learns that Julie will be majoring in architecture, and that Julie wants to tour the city before school starts.
- 3) Linda uses ‘My City Counselor’ to become a counselor for Julie. Linda lists several popular tourist attractions. She writes short descriptions about the places and the reasons why she recommends them. Linda shares the listing with Julie. Julie logs into the system, and sees recommendations and reviews from Linda.
- 4) After Linda adds her listing, the system adds the latest news about these places in real time so that the listings remain current.
- 5) When Julie visits some of the places Linda recommended, she can view information on her mobile phone. When Julie visits some of the places Linda recommended, she can view information on her mobile phone and add reviews about things she likes or dislikes.

- 6) Linda is notified that Julie just posted a review about a place Linda recommended. Linda checks other places where Julie has visited and her reviews about those places. Linda finds out that Julie is more interested in historic architecture locations rather than tourist attractions. Linda adds information about the Hartwood Mansion in Hartwood Acres. Unknown to many, it was Mary Lawrence's house, built in the 1920s, that is now open to the public. Linda thinks Julie would love it.
- 7) Also, Linda thinks Robert, her old friend and a retired architect, might be an interesting person to help Julie learn about Pittsburgh. Linda suggests that Julie checks Robert's public page, and asks if Robert might make some suggestions for Julie.
- 8) Julie gets a notification that Linda added Robert as one of Julie's counselors. Julie checks Robert's page, which provides lots of information about architecture in Pittsburgh.
- 9) On Sunday, Julie visits Hartwood Mansion based on Linda and Robert's recommendations. Julie takes a tour and accesses Robert's comments on her mobile phone. Julie takes photos and shares them with Linda and Robert.
- 10) Linda sees Julie's photos from the Hartwood Mansion. The system searches and shows Linda's photos taken at the mansion in the past. One of the photos is the one she took in 1994, when Linda had a private birthday party in the dining room there. She reminisces by looking at the photos from the party.
- 11) The system asks Linda if she wants to share the photos with subjects in the photos who are also on 'My City Counselor'. Linda selects some people and sends them photos along with a short message.

Interfaces

We used three platforms: a digital photo frame, a computer, and a mobile phone. Each platform functions differently and the interface of each one is designed for supporting the main functions. First of all, a digital photo frame is mainly for elders for slide shows, real-time updates, and a quick input. A website is for detailed search and editing. And, a mobile phone application is targeted for young people for quick search and review.

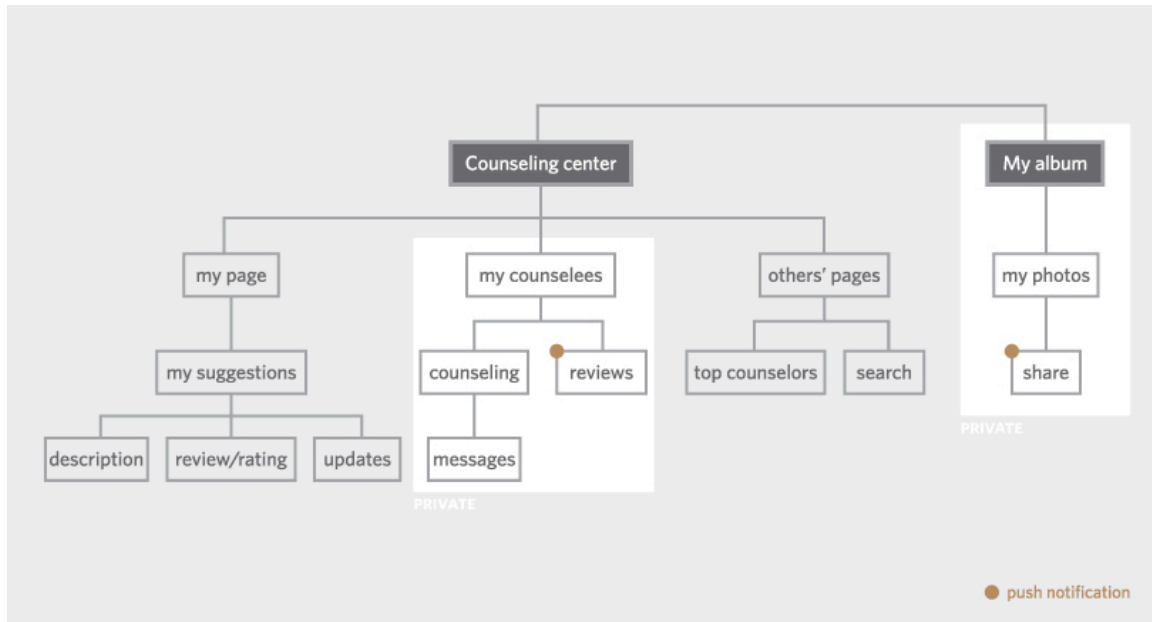


Figure 14 'My City Counselor' information architecture (Lee, Y. 2011)

Reflection and Evaluation

This project has focused on researching, analyzing, and conceptualizing. The various ways of inputting, displaying, and controlling need to be further explored. Voice input interfaces have been suggested for elderly usages and can be an alternative. Also, the interactions between local counselors and between a counselor and a counselee need to be elaborated further.

Conclusion

The goal of this thesis is to improve elders' social interactions, through the design of an interactive tool that focuses on friendships, travel, and knowledge and memory of a particular place. This work is based on a study of the social interactions of the elderly. These interactions often diminish as elders experience dynamic physical, social, and cognitive decline. We examined how technology might extend these diminishing social interactions. We looked for the ways to minimize the technological barriers faced by the elderly in order to more easily integrate the technology into their lives.

We conducted qualitative interviews and site visits to better understand the elderly and their relationships. Everyone had different situation and relationships. But, all the elders we met tried to stay independent and be meaningful for themselves and for society. Also, we learned how elders use technologies by observing and interviewing.

New products need to support the five values that elders uphold: autonomy, personal growth, pleasure, social ties, and helping (Dorfman, 1994). Products should also support fundamental needs caused by physical or mental decline that is a normal part of aging. Finally, an understanding the characteristics of relationships is needed; asymmetry of

intergenerational relationships is often overlooked and needs to be addressed in the design.

Our design concept, 'My City Counselor', is a service that elders can use to actively engage in a community by sharing accumulated knowledge about local area. It is an interactive tool that elders can use to reminisce about the past with their friends and family. We developed a scenario showing how an elder provides a customized guide for a freshman student in collaboration with another local elder. In the scenario, the process of providing information and receiving feedback, memories are triggered and shared.

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