

## Part 1: Understanding the Problem



# Assisted Living Communities: An Old Yet New User Group

Team: Let's Get Weird

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# Introduction

Over the past four decades, the life expectancy of an average American has increased from 70.8 years (in 1970) to 78.3 years (in 2010), which is an astounding 7.5 years of increased living time<sup>1</sup>. Not only are people living longer, but also they are staying active longer. People are healthier and more active than they have ever been<sup>2</sup>. This growing demographic of active elderly people brings entirely different values, beliefs, requirements, and needs to current technology design space that is centered around a younger demographic.

Although people are living a longer life, they are not becoming less susceptible to age-related diseases. According to statistics by the Alzheimer's Association, Alzheimer's disease is the 6th leading cause of death in the United States; 1 in 3 seniors dies with Alzheimer's or another dementia<sup>3</sup>. Dementia is defined as "an overall term for diseases and conditions characterized by a decline in memory or other thinking skills that affect a person's ability to perform everyday activities"<sup>4</sup>. In the state of Georgia, it is estimated that the cost incurred from caring for those who have Alzheimer's or other dementias is \$214 billion in 2014, and will continue to increase to \$1.2 trillion by 2050<sup>5</sup>. According to an experiment conducted by the Gazzaley Lab at University of California San Francisco, the researchers have found that video game training could enhance cognitive skills that decline with age, especially for those aged 60 and up<sup>6</sup>. Another research study also shows significant impact cognitive training has on cognitive abilities among older adults with a mean age of 73.6<sup>7</sup>. Not only is dementia an enormous financial burden on society, it also exerts huge emotional toll on caregivers. Therefore, through our external research and study on the target user group, our team aim to explore this social and physiological problem by means of modern technology. Our design team will provide a solution to this compelling user group and their frequently forgotten design space.

# Protected Users

In order to gather user requirements for this project we hoped to interview and observe members of an assisted living community in the Greater Atlanta area. Given the protected status of this user community, we had to overcome a few hurdles in order to gain access to our users. We knew that we would have to gain the interest of the staff in order to partner with their retirement facility. We cold-called eight local facilities until finally one of the staff members had an interest in our project. Despite the staff's interest, we could not immediately sit down with the residents of the senior community. We first had to meet with a member of the staff to ease any concerns about our motives. This meeting also proved to be helpful for contextual information gathering. After this meeting, the staff member then had to confirm with the rest of the management staff about our visitation privileges. We are currently awaiting the sign-off from the rest of the staff, and are hoping to meet with the residents later this week. Due to the latency in collecting direct user requirements, we will consider two proposed systems in this report.

## Overview of the Users

Primary User - Residents of an Assisted Living Community

### **Demographic**

Our target user group is the senior residents at Emeritus Senior Living, located in Sandy Springs, GA. The residents range in age from 70 to 80 years old. The current capacity of the facility is about 60 residents. The majority of the residents are Caucasian. The socio-economic status of the residents is currently unknown.

### **Occupation**

Although the residents are all out of the work force, a few volunteer to offer free lessons such as music and cooking classes to other residents as well as the local community. The residents' professional experiences and education backgrounds are currently unknown.

### **Tasks/Goals of Residents**

The overall goals of the residents are to enjoy their retirement life, reinstate personal values, stay healthy and independent. To achieve the goals, the management team as well as the residents hope to foster better connections between the residents and their families, especially for those whose families are not in the state of Georgia. Residents oftentimes find the need to express their personal feelings and opinions to others. To help residents stay self-reliant, the coordinator arranges tasks such as grocery shopping, lunch trips and scenic trips.

### **Technology Available**

Many residents use their own cell phones. The percentage of smartphone usage is currently unknown. The residents are not provided with land-line phones in their rooms. There is a Wii console in the common area for residents to play games. A large flat screen TV is also available in the common area. Personal computers are available to all residents. There is an existing internal website for Emeritus management team, and a generic website for advertising purposes. There is no social media presence due to privacy concerns.

### **Experience using technology**

Most of the residents are not technologically savvy to perform complex tasks on technological devices. The majority of residents use cellphones to make phone calls. Some residents use Wii console to play active games such as bowling and tennis. Some residents use personal computers in their rooms for playing games and online social interaction. It is noticeable that the few tech-savvy residents have the tendency to exclude themselves from social activities.

### **Mobility/Accessibility/Handicaps**

Many of the residents with limited mobility use walkers. A few residents depend on wheelchairs. Getting residents on and off the buses is a big challenge for the coordinator. Due to limited mobility and memory loss, residents are mostly limited to indoor activities that require minimal physical movements and simple logic processing.

### **Interests, Attitudes, Values**

Interests vary from resident to resident. Most residents like to participate in games and social activities to win small prizes. Examples of the prizes include free massages and home goods. It is noted that the music is a big attraction to the residents. Some residents were musical professionals or are currently learning musical instruments. Many enjoy live music. Residents like activities that provide food and drinks, especially alcoholic beverages. Borrowing ideas from Make-A-Wish Foundation, coordinators at Emeritus are also seeking ways to help residents achieve their last goals. For example, one resident had the chance to fly an airplane with the help from the community.

### **Dislikes**

A hard copy of the monthly schedule of activities is given out every month. Residents dislike when any changes or cancellations occur. They also dislike rules even though many of the rules are enforced for safety concerns. Residents have the chance to express their likes/dislikes during the resident council meeting on the second Friday of every month.

## **Secondary Users - Staff of Assisted Living Community**

### **Demographic**

Our secondary users are the members of the management staff at Emeritus Senior Living. The staff range in age from mid-thirties to late-fifties and are predominantly female. The management team spends at least six days out of the week at the Emeritus facility. The staff lives within the Greater Atlanta area.

### **Occupation**

The possible positions held by the staff members include: senior executive director, community relations director, life enrichment director, business office director, maintenance director and resident care director. One staff member was previously a wedding planner and another a nurse practitioner. The staff's employment durations also vary from 6 weeks to up to 5 years.

## **Company Info**

Emeritus Senior Living currently employs up to 60 employees. The facility also hires resident assistants, housekeeping and maintenance, and a dining services staff. The facility is owned by the Emeritus Senior Living Corporation, which has recently been acquired by the Brookdale Corporation.

## **Education**

Currently unknown

## **Computer Experience**

The management staff is familiar with smart phones and personal computers. The event coordinator self-identified to be moderately technologically savvy. She has experiences taking pictures with her iPad and setting up a Nintendo Wii console for the residents. The management staff are also familiar with a company Intranet system. The staff's overall experiences and proficiencies with other types of technologies are unknown.

## **Tasks**

The Emeritus corporate requires seven planned activities each day for the residents. The management staff must be present to moderate and facilitate these events. The management staff are also tasked with the upkeep of the general well-being of the residents.

## **Domain Knowledge**

The management staff have a first-hand and in-depth knowledge of the residents. The knowledge includes the residents' issues with dementia and its burden on their families. The staff also have knowledge of the residents' desires, wishes, and personal values.

## **Technology Available**

Same as the primary users. However, the staff have their own smart phones and personal devices.

### **Interests, Attitudes, Values**

The management staff is passionate about helping the residents improve their quality of life, including the prevention of dementia and maintaining a social and cozy living environment. Although there is only a small number of staff on site, a lot of responsibilities fall on them to support the residents. The staff believes that technology can help alleviate some of the burdens. They also want to explore the possibility of delaying the development of dementia through technology such as interactive games.

### **Criticality of Errors**

If the management staff makes an error while proctoring a game, the residents may experience fatigue, frustration and confusion. The error itself can also inadvertently defeat the purpose of the game, which was originally designed to reduce memory loss, therefore hindering any efforts to prevent dementia. For example, if the event staff forgets to inform residents about an event cancellation, the disappointed residents will have wasted all the hours they use to get ready for the event on top of physical and emotional exhaustion.

## **Analysis of the Existing System**

### **Analysis of the Event Information System**

The current activity system at Emeritus Senior Living is a manual-based process where coordinator notifies the residents on upcoming games through a paper calendar at the beginning of each month. Residents are also informed about different kinds of activities through word of mouth. There are seven events daily, all run by the same coordinator. Additionally, a table tent on the concierge table informs residents the events of the day. The events include games (Bingo, Uno, Wii Bowling, Solitaire), cooking lessons, arts and crafts, brain power exercises, book club meetings, relaxation and meditation sessions, scenic trips, lunch trips, social hours, grocery trips, movie screenings, Bible study, resident council meeting, cocktail hours, etc. All events require the coordinator's physical

presence and undivided attention. Participation in all events is voluntary, hence not everyone attends all the events. The coordinator use gifts and prizes as incentives for residents' participation. It is not possible for the staff management to notify the residents about last minute changes to the event schedule, leaving the residents in frustration. Emeritus is not allowed to provide medication for the residents, therefore events that provide alcoholic beverages are cancelled due to extra health precaution and liability concerns.

EMERITUS at Seelye Springs A Brookdale® Community		Omnicare www.omnicare.com		Personal Care		September 2014	
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
	<b>LABOR DAY</b> 10:00 Sit and Be Fit 11:00 Fall Door Wreath 2:15 Rosary 3:00 Bingo 5:00 LABOR DAY BBQ in Garden 7:00 Card Party	<b>1</b> 10:00 Morning Walk 11:00 Mental Fitness 12:30 Coffee Chat 2:00 Fall Crafts with Deb 3:00 Wii Bowling 4:00 Grandparents Day Planning 8:00 Book Club	<b>2</b> 10:00 Stretch and Flex 10:30 Grocery Shopping 11:00 Cafe Cards 1:30 Floral Design with Deb 2:15 Bible Study 3:00 Grandparents Desserts 6:30 Men's Club	<b>3</b> 10:00 Morning Meditation 10:30 Manicures 10:45 Exercise With Jodi 1:30 Crafts with Deb 3:00 Scenic Drive 4:00 UNO With Tammy 6:30 Puzzle Club	<b>4</b> <b>TGIF</b> 10:00 PT Workout 10:30 "Today in History" 11:30 Out to Lunch 2:15 Music Lovers 3:00 Bingo 3:45 Cocktail Hour 7:00 Evening Movie	<b>5</b> 10:30 Brain Power 11:15 Crossword Puzzle 2:00 Bocce Ball 3:00 Paint Away 4:30 St. Andrew's Bus 5:30 BBQ FUN 7:00 Saturday Silver Screen	
<b>GRANDPARENTS DAY</b> 10:00 St. Andrew's Bus 10:00 Stretch and Flex 10:30 Coffee and Chat 1:00 Tailgate Sunday 2:00 Grandparents Day Dessert Social 8:00 TV Show: "Secret Millionaire"	<b>7</b> 10:00 Sit and Be Fit 11:00 Pictionary 1:00 CRAFTY CRAFTS 2:15 Rosary 3:00 Bingo 4:00 Men's Muscles 7:00 Card Party	<b>8</b> 10:00 Morning Walk 10:30 Coffee Chat 11:00 Mental Fitness 1:00 Apron Art 3:00 Wii Bowling 7:00 Book Club	<b>9</b> 10:00 Stretch and Flex 10:30 Grocery Shopping 11:00 Cafe Cards 1:30 Crafts with Deb 2:15 Bible Study 3:00 Bananas Foster with Chef John 6:30 Men's Club	<b>10</b> <b>PATRIOT DAY</b> 10:00 Morning Meditation 10:30 Manicures 10:45 Exercise With Jodi 11:00 Throwback Thursday 3:00 Scenic Drive 4:00 UNO With Tammy 6:30 Puzzle Club	<b>11</b> 10:00 PT Workout 10:30 "Today in History" 11:30 Out to Lunch 3:00 Bingo 3:45 Cocktail Hour 6:00 Health and Wellness Seminar 7:00 Evening Movie	<b>12</b> 10:00 Morning Walk 10:30 Brain Power 1:00 Ready For Football? 2:00 Bocce Ball 3:00 Paint Away 4:30 St. Andrew's Bus 5:30 Pizza and Pizazz 7:00 Saturday Silver Screen	<b>13</b>
10:00 St. Andrew's Bus 10:00 Stretch and Flex 10:30 Coffee and Chat 1:00 Tailgate Sunday 2:00 Scenic Drive 3:00 Sundae Social 8:00 TV Show: "Secret Millionaire"	<b>14</b> 10:00 Sit and Be Fit 11:00 Plates with Little Bugs Ceramics 2:15 Rosary 3:00 Bingo 3:45 Music Lovers 7:00 Card Party	<b>15</b> 10:00 Morning Walk 10:30 Coffee Chat 11:00 Mental Fitness 1:00 Tea Party Hats w/Deb 3:00 Wii Bowling 4:00 Brain Power 8:00 Book Club	<b>16</b> 10:00 Stretch and Flex 10:30 Grocery Shopping 11:00 Cafe Cards 1:30 Crafts with Deb 2:15 Bible Study 3:00 Microwave Specialties 6:30 Men's Club	<b>17</b> 10:00 Morning Meditation 10:30 Manicures 10:45 Exercise With Jodi 1:00 Brain Power 3:00 Thrift Store Bargains 4:00 UNO With Tammy 6:30 Puzzle Club	<b>18</b> 10:00 PT Workout 10:30 "Today in History" 11:30 Out to Lunch 2:15 Mahjong 3:00 Bingo 3:45 Cocktail Hour 7:00 Evening Movie	<b>19</b> 10:30 Brain Power 1:00 Ready for Football? 2:00 Bocce Ball 3:00 Paint Away 4:30 St. Andrew's Bus 5:30 Southern Fare Dining 7:00 Saturday Silver Screen	<b>20</b>
<b>Inter. Peace Day</b> 10:00 St. Andrew's Bus 10:00 Stretch and Flex 10:30 Coffee and Chat 1:00 Tailgate Sunday 2:00 Scenic Drive 3:00 Sundae Social 8:00 TV Show: "Secret Millionaire"	<b>21</b> 10:00 Sit and Be Fit 11:00 Bunko Buddies 2:15 Rosary 3:00 Bingo 3:45 Music Lovers 4:00 Men's Muscles 7:00 Card Party	<b>22</b> <b>First Day of Fall</b> 10:00 Morning Walk 10:30 Coffee Chat 11:00 Fall Crafts 1:00 Puzzle Time 3:00 Wii Bowling 3:45 Social Hour w/ Alan 8:00 Book Club	<b>23</b> <b>Rosh Hashanah (Sunset)</b> 10:00 Stretch and Flex 10:30 Grocery Shopping 11:00 Cafe Cards 1:00 Floral Design with Deb 2:15 Bible Study 3:00 Resident TOP CHEF. Guess WHO? 6:30 Men's Club	<b>24</b> <b>Rosh Hashanah</b> 10:00 Garden Meditation 10:30 Manicures 11:00 Throwback Thursday 1:00 Men's Club 3:00 Scenic Drive 4:00 UNO With Tammy 6:30 Puzzle Club	<b>25</b> <b>Rosh Hashanah</b> 10:00 PT Workout 10:30 "Today in History" 11:30 Out to Lunch 2:00 Crafts with Deb 3:00 Bingo 3:45 Cocktail Hour 7:00 Evening Movie	<b>26</b> 10:30 Brain Power 11:15 Crossword Puzzle 1:00 Ready for Football? 2:00 Bocce Ball 3:00 Paint Away 4:30 St. Andrew's Bus 6:30 Ice Cream Social 7:00 Saturday Silver Screen	<b>27</b>
10:00 St. Andrew's Bus 10:00 Stretch and Flex 10:30 Coffee and Chat 1:00 Tailgate Sunday 3:00 Sundae Social 6:45 Brain Power 8:00 TV Show: "Secret Millionaire"	<b>28</b> 10:00 Sit and Be Fit 11:00 Pictionary 2:15 Rosary 3:00 Bingo 3:45 Music Lovers 4:00 Men's Muscles 7:00 Card Party	<b>29</b> 10:00 Morning Walk 10:30 Coffee Chat 11:00 Mental Fitness 1:00 MUSIC LOVERS 3:00 Wii Bowling 7:00 MOVIE NIGHT 8:00 Book Club	<b>30</b>				

Figure 1 – The monthly activities calendar distributed to all residents at the beginning of the month.

## Analysis of Gaming System on Helping Residents with Dementia

A majority of the Emeritus Senior Living residents suffer from dementia, which usually develops at an older age and affects memory and cognitive abilities. It also has a negative

impact on the patients' daily routines. According to the management staff, a few of the dementia patients do not realize or accept that they are suffering from any dementias. However, there have been isolated cases in which a resident accepted having dementia and requested recollection assistance from the staff. However, the nature of dementia itself makes it difficult for staff and residents to judge the severity of individual cases. Apart from keeping the residents active and involved, the facility is keen to help its residents alleviate their memory loss problem. The staff have also commented that the residents have an aptitude for learning new games. This learning propensity, gusto for winning prizes, and void of medical intervention has prompted the staff to help the residents strengthen their short term memory through games. The staff organize games and events such as "Brain Power", "Pictionary" and "Mental Fitness" at least once a week. All games and events require the coordinator's physical presence and undivided attention constantly. Participation in all events is voluntary.

## Task Analysis

To conduct the task analysis of a proposed game system for the senior residents, our team decides to apply the Human Processor Model that allows us to calculate cognitive and motor processing time while the users perform a task. However, due to privacy and sensitivity concerns, we did not yet have the chance to personally observe our end users, who are the senior residents at Emeritus, to perform an existing task. However, we looked at current studies on similar topics and mapped out a possible task analysis if we were able to interview the residents in person. We plan to observe the residents during a non video game session (Bingo) and a video game session. The team proposes a structured task analysis based on the Human Processor Model as follows:

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### Task analysis for non-video game session (Bingo)

1. Prepare Bingo session with coordinator in the common area prior to the session time.
2. Observe the order of residents' arrivals, whether residents with limited mobility need assistance with walkers and wheelchairs from the coordinator.
  - 2.1. Individually time how long the coordinator helps each individual get seated.
  - 2.2. Count the total number of participants at the event and number of announcers and coordinators.
3. Distribute Bingo supplies to each resident
  - 3.1. Time how long it takes the coordinator to distribute all the supplies to everyone, including bingo cards and markers.
  - 3.2. Take notes on any outstanding problems and incurred inconvenience during the distribution of the supplies.
  - 3.3. Observe whether the residents experience difficulty while using the supplies.
4. Bingo session starts
  - 4.1. Each group member observes one resident's performance during the game session. Pay special note on the residents' hand gesture, verbal communication and other visual cues.
  - 4.2. Note any problems the residents inform the coordinator.
  - 4.3. Note the pace at which the set of numbers are announced.
  - 4.4. Observe of how the users keep track of their progress in the game.
  - 4.5. Keep track if they have missed a number.
  - 4.6. Keep track of the comments received by the winners from others.
  - 4.7. Keep track of the residents' level of enthusiasm.
5. Bingo session ends
  - 5.1. Keep track of the residents' level of enthusiasm after the game.

- 5.2. Note whether any residents have the intention to stay back for some more rounds of game.
6. Winners receive prizes
  - 6.1. Take note the type of prizes received by the winners.
7. Next round/iteration
  - 7.1. Observe whether any new players join the game after the first round
  - 7.2. Observe whether any old players quit the game after the first round
8. End of the game

### Task Analysis for Event Attendance Decision Process

1. Resident Gains Knowledge of Event - Information about events can come from the following sources. Observer must gain understanding of which source influenced the user. Provide a Likert scale based on influence for each possible info source.
  - 1.1. Monthly calendar produced by the event coordinator
  - 1.2. Table tent of today's events displayed in the front office
  - 1.3. Event sign-up sheet available at the front office
  - 1.4. Other residents
  - 1.5. Management staff verbal correspondence
2. Resident's Decision to Attend Event - Observer's steps to understand how and why a decision was made to attend or not attend
  - 2.1. Document the decision points of attending the event
  - 2.2. Elicit the pre-conceived notions the resident has about the event
  - 2.3. Identify key time points during the decision process
  - 2.4. Enumerate any physical issues that hindered attendance
  - 2.5. Enumerate possible scheduling conflicts with the event
  - 2.6. Discuss past experience at the event
3. Preparation for Event - Observer documents the necessary preparation to attend an event.
  - 3.1. Define event-specific subtasks to complete and how long each task takes.
  - 3.2. Daily tasks necessary to attend event and how long each task takes (could include getting dressed, taking medication, etc.).

- 3.3. Tasks that require assistance from staff and how long each task takes.
4. Unforeseen Exceptions - Observer must understand and document unpredictable occurrences that derail plans to attend event.
  - 4.1. Cancellation of event by management staff - document reasons for cancellations and frequency.
  - 4.2. Visitation from Family - document frequency.
  - 4.3. Precedence of more important event - document frequency.
5. Attending Event - Observe participation of resident during the event.
  - 5.1. Compare participant's actions during the event to pre-conceived notions of actions
  - 5.2. Subjective analysis of the enjoyment during event
  - 5.3. Document number and intensity of interactions with other residents during the event.
6. Post-Assessment of Event - after the event has taken place, aim to assess the resident's experience at the event.
  - 6.1. Document participant's post-event description of the event.
  - 6.2. Compare participant's post-event recap to observed participation.

## Overview of the Proposed System

### Proposal for an Event Information System

Our team proposes to develop a system, which would help the staff management schedule the events more efficiently. The system would also keep the residents notified about the upcoming events along with their current status. The residents will be informed about any cancelled event immediately, thus reducing their frustration. The proposed system will also enable the residents to form different interest groups amongst themselves and organize events/meetings for the same. If the residents take an initiative to coordinate events, it will reduce some burden of the coordinator. We also plan to use this system to increase awareness about the events and motivate residents to participate. For this, the system could showcase some photographs from the past events, thus enticing the

residents to attend the future events. This would ultimately lead to an increased level of participation.

### Proposal for Game That Alleviates Dementia

Our team proposes to develop a game which makes use of the current technology and which would help in alleviating the residents' dementia. There are several factors that we need to keep in mind while developing this game. The game has to be fun to play because we want to increase the participation levels of the residents. The residents are excited to play the other games because of the prizes involved, our game could possibly follow the same model. The residents can perform only limited physical activity; amongst them there are a few who use a wheelchair. Therefore, the game should involve minimal physical exertion and be easy to play. The residents currently play 'Wii Bowling', this physically active game provides a benchmark for the appropriate level of physical activity in our designed game. Our team needs to leverage the current technology available in the user community. The facility provides computers, television set and Nintendo Wii gaming console to the residents. Two of the residents have their personal computing devices, which they use for playing games and online social interaction. However, these residents prefer staying in their rooms and do not interact much with other residents. Musical games could be one of the potential genres. There was an instance where a resident came up with a new game called 'Name that tune' while listening to music.

## Social and Technical Context of System

Our design will be used in the context of an assisted living community within the Greater Atlanta area. The community's complex includes fully furnished apartments for each of the residents, as well as a large dining room, snack café, lounges, and computer studies. A full-time staff of managers, nurses, cooks and volunteers provide care and services to the community's residents. The management staff at the facility has the responsibility of improving the quality of life for the residents through community structure and activities.

As an assisted living community, this facility has specific social constructs that define the level of care and abilities of the residents. Residents in assisted living homes tend to be more active than most retirees. An assisted living community provides necessary nursing support to residents. However, an assisted living home does not provide around the clock nursing services to their residents. This community in particular has to politely ask residents to find a nursing home to live in when their medical needs eclipse the support of the nursing staff. Residents are also welcome to leave the grounds of the community pending a sign-out. If residents are not able to drive on their own accord, the staff provides group transportation to local shops, restaurants, and events.

Interaction with people outside of the community is often with family members and student visitors. The residents' communication with family members differs from infrequent communication to daily communication and from phone calls to visits in person. Some family members live outside of the state, and other family members live within driving distance to the assisted living home. Other outside visitors include student groups that come to the assisted living community to socialize with residents.

## Usability Criteria

The following usability criteria will be used in our design process and evaluation:

### 1. Learnability

**Familiarity** - Users might apply their knowledge from previous games, social events or interaction with everyday objects while using the system.

**Predictability** - Instructions given by the system should be easy to read and follow, for users who are not familiar with using technology. The outcome displayed might or might not align with the user's expectations.

**Consistency** - Design elements such as the layout, fonts, colors should be consistent across the system. For example, the users might associate a certain color to a function,

which could make it easier to use the system. Major design changes could disorient the users.

## 2. Flexibility

**Dialog Initiative** - The system should give users clear prompts on what the user needs to do next. Older users might need these prompts to understand what actions they need to perform next. In some cases the system might not give prompts which allows the user more flexibility.

**Substitutivity** - The system should allow users to perform tasks and present the output in a format that the user can relate to. This could help residents with limited knowledge of technology understand the system better.

**Task Migratability** - Users with limited mobility and memory loss might not be able to carry out certain tasks on the system accurately or might not want to perform some tasks. The system should be able to automate such tasks.

## 3. Robustness

**Observability** - Users with limited experience using technology should be able to navigate through the system easily. The user should understand his/her current position in the system.

**Recoverability** - The error rate of users who are old might be higher. Error messages should be easy to read and understand. The system should allow users to easily recover from an error.

**Responsiveness** - The system should respond to users inputs quickly and accurately. Doing so will alleviate weariness of users who are unfamiliar with technology.

# Information Gathering Techniques

The above user and design-space information was gathered through an interview process with the retirement community's event coordinator. This interview advantageously served the interviewer and the interviewee by providing our team with contextual knowledge and vetting any concerns of the coordinator about allowing strangers to interact with the residents. Our team decided on the interview process in order to leave the discussion open to possible innovations and for aggregation of all possible user-related and contextual information. A survey was deemed inappropriate due to the lack of prior contextual knowledge. We also hoped to build a relationship with this community and felt that a survey would be too impersonal.

Before the interview, our team created relevant questions to ask the event coordinator (see below). The team also devised a set of relevant prompts for the residents in case we were able to interview and observe them during this initial visit.

## Questions for Event Coordinator

- *“Can you tell me a little about the demographic of the residents?”*
- *“Do you think there are some problems that need to be addressed that the residents are facing? Are there anything you feel like could have been solved using technology?”*
- *“Are there any activities that can be improved with the help of technology?”*
- *“What are some examples of the events organized by the management team to increase interaction within the community?”*
- *“How would you inform the residents about these events?”*
- *“Do you think the residents will be able to attend the activities?”(lead into questions asking about their medical and mental states)*
- *“ Do you think the current level of social activities provided by the facility is enough to satisfy the residents' demand?”*

- *“How often do you see residents using technology? If so, are there cases where you have to assist them?”*
- *“What types of technological devices are currently provided in the residents’ homes?”*

The following questions for the residents were revised in accordance to the interview with the event coordinator. The observation and interviews with the residents are currently scheduled for later in the week (due to the protected nature of our users, we were not able to get immediate access to the residents).

### Questions for Residents

- *Which events/activities do you enjoy participating in?*
- *Do you have a particular interest in the subject/event that you participate in?*
- *Do your friends at Emeritus participate with you? Do you attend as a group?*
- *Are there any events that you are interested in trying but have not attended yet? What reasons do you have for not attending?*
- *Do you enjoy having your picture taken while participating in the events?*
- *Would you feel comfortable having these images posted? Would you like to see pictures of other residents?*
- *Where do you spend most of your time at Emeritus, other than in your room?*
- *Do you own a mobile phone? Which model? Smart or dumb phone?*
- *What do you use your phone for? Are you able to take pictures with your phone? Are you able to receive text messages?*
- *Do you use a PC? Please describe the activities that you use your PC for.*
- *Do you have any specific hobbies and interests? Please tell me about them.*
- *Do any of these hobbies take you off Emeritus campus? How often do you leave Emeritus?*
- *Please tell me about your family. Where do they live? Are they able to come visit you? What do you do with them during a visit?*
- *How else do you stay in touch with your family?*

- *Personal question, feel free to refrain Do you have trouble with short-term memory? Do any of your peers have trouble with short-term memory? Please elaborate on difficulties and any diagnoses.*
- *What is your education level? (Important for dementia research)*
- *Are you currently retired? Or do you currently work? Where did you work and what did you do?*

## Design Implications

After analyzing the characteristics of our user group and the existing system, we have defined the following design implications for our solution.

### Users

The system should minimize physical movement as the user group has limited mobility. The system should be accessible from a seated position, as the majority of users require the assistance of walkers.

The system should not be physically demanding and should not require prolonged use as elderly people have weak stamina and get tired easily.

The user group has poor vision. Therefore the text on the system, if any, should be brief and the font should be large in relation to the physical position of the user.

Some users suffer from dementia and have limited short-term memory. The system should account for this deficiency by using a flat hierarchical structure which does not require users to remember previous system states.

Although the residents are categorized in the general “elderly” group, there are still variances among different sub groups. For instance, the younger residents are much more independent and mobile than the older ones. They also do not all have the same level of cognition or interest in events.

## **Environment**

The participation in events is not mandatory. A faction of the residents prefers staying in their rooms instead of participating in the events. Hence, the system should be fun and enticing enough to motivate all residents to participate.

The residents' most well-known motive for attending events is to win prizes. The proposed system should have a similar reward system so that it ultimately increases user participation.

## **Technology**

Our user group does not use technology often. The system should reference attributes of the existing system in order to facilitate the users' transition into a technology-based system.

Currently the assisted living center has limited publicly available computing systems and digital displays. The facility also has limited funds to purchase new materials and supplies for activities. The system should aim to use the existing technology setup, or to provide a compelling enough reason to allocate funds for new hardware.

## **Conclusion and Next Steps**

After studying the user group and their environment, we have developed a better understanding of our problem space and the subsequent design implications. However, in order to determine which of the two proposed design strategies (game system and event coordination system) has greater positive impact on the community, our team needs to continue with user studies. In the next stage of the design, we will complete our task analysis by observing the user group perform tasks in the existing game system. We will look at the specific steps that go in organizing an event from the coordinator's perspective. We also plan to examine the residents' opinions and preferences about the events and their coordination.

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