

## 2D: Design Research Review

### Summary of Key Findings or Takeaways

According to our research and interviews, we were able to learn more about our participants regarding their actions and behaviors towards dealing with seniors who suffer memory loss. We found that monitoring, reminding and notification systems for those people and their related environment will help reduce stress on family caregivers and potentially avoid costly emergency room visits or hospitalizations by spotting problems earlier. Our primary and secondary research reveal the design direction for us to focus more on the intuitive and human-centered solutions integrated with the trending technologies.

### Design Research Participants

#### *Participant 1*

Semi-structured interview. Participant 1 is a 21-year old male living in Seattle, WA. He works part-time as a caregiver at a local assisted living facility that has residents that suffer from no or minor to severe memory loss. He helps various residents with daily activities such as eating, moving around, using the bathroom and going to bed. One resident he interacts with often has trouble with getting from place to place and task completion, and uses limited technology such as a landline phone and an old-fashioned TV. He finds that talking about familiar things such as their past or family helps people who are experiencing memory loss. A major pain point in his caregiving experience is not knowing the circumstances around incidents if something were to occur when no one was around to see.

#### *Participant 2*

Structured interview. Participant 2 is a 65 year old male living rural area in Fuzhou, China. He works as a community manager at his hometown. He was the caretaker for his mother for more than 10 years until his mother passed away in 2014 at age 89. He lived with his mother in the same house. His mother suffered different levels of memory loss for over 3 years, ranging from loss in the basic information such as names and birthdays to the loss in behaviors such as forgetting daily routines. Participant 2 mentioned that the memory loss issue on his mother were unstable and unpredictable, which made him worry about the independent living ability of his mother, especially when it comes to the safety-related issues, such as forgetting turn off the gas range after cooking. He was acted as a real-time reminder for his mother.

#### *Participant 3*

Semi-structured interview. Participant 3 is a 57-year-old male living in Seattle, WA. He works as a project manager for the Port of Seattle. He was the caretaker for his father for more than two years until his father passed away in 2015 at age 92. His father lived in the house next door to the participant, and suffered from short-term memory loss. He would consistently forget what he had

eaten and what activities he had done earlier that day. He would also forget to take medications and forget to do basic tasks such as shutting off the water when filling the bathtub. Participant 3 indicated that a huge problem his father faced was that he would sometimes take medication pills out of the bottle, but then forget to actually eat them.

## **Design Research Themes**

We discovered many things throughout these interviews, which can be sorted into three major themes:

### *Individuals with memory loss are very diverse*

Memory loss is a wide spectrum, and even focusing on mild memory loss yields a large variety of symptoms and needs. The individuals being cared for in all of our cases had different needs and responses to experiencing memory loss. Participant 1 works with a resident who is socially apt but forgets important cues such as needing to use the bathroom. This resident feels confused and scared when experiencing memory loss. Another resident in the same unit has mild confusion across the board but become irritable and frustrated when experiencing memory loss. We will need to make sure to address underlying causes of these varying symptoms in order to help as many people as possible.

### *Familiarity is the best way to help someone experiencing memory loss*

All of our participants agreed that talking about familiar aspects of a person's life, especially family, are helpful in helping someone to remember or calming someone who is distressed because of memory loss. Participant 1 would talk about a resident's grandfather who was a dentist to remind her to brush her teeth. Participant 2 would use photo albums to help the individual remember names and basic information about people. Participant 3 would show the individual photos to improve their mood. This theme tells us that if our solution is to be interacted with by the individual with memory loss, it will be important to incorporate as many familiar interface elements as possible.

### *Caregivers want to make sure these individuals are well without watching all the time*

All of our participants were concerned with things that happen to individuals with memory loss when they are not being watched. Participant 1 performs safety checks in the residents' rooms every 2 hours, but worries about things that happen between the checks. For instance, if someone is found in their room distressed and is unable to communicate why, it will be much harder to help that person. Participants 2 and 3 care for people with memory loss at home and worry about them while at work. The inability to know what these individuals are doing at home can lead to forgotten tasks such as taking medicine or repeated tasks, such as cooking a meal that has already been prepared. Even with hiring a daytime caretaker, Participant 3 would constantly worry about their father at home. Our design should focus on giving caretakers peace of mind on the appropriate completions of tasks while not being too intrusive on the individual with memory loss.

## **Task analysis questions**

### **1. Who is going to use the design?**

We are focusing primarily on seniors with short-term memory loss who live in their own home (i.e., not an assisted living home). Based on our research, it seems that memory-impaired seniors who do not live in nursing homes face particularly difficult memory-related problems since they do not have 24/7 care available to them. Instead, they must rely on themselves, a family member, and/or a hired caretaker who is around regularly or occasionally. We also wanted to focus more on mild memory loss, since individuals with severe levels of memory loss are more likely to already be in an assisted living facility.

### **2. What tasks do they now perform?**

From our interviews, it seems that the individuals with memory loss attempt to perform regular daily tasks, such as waking up, eating, taking medications, performing a hobby, exercising, shopping, bathing, and sleeping.

### **3. What tasks are desired?**

Our interviewees report that the individuals with memory loss have difficulty executing some of the tasks above. Due to forgetfulness, they may forget to take medications, turn off running water, or buy groceries. A solution to remedy this forgetfulness and to help these individuals perform daily tasks more easily is desired.

### **4. How are the tasks learned?**

Daily tasks are generally performed for many years out of habit. However, as we learned from our interviews, sometimes things change which can throw off a routine, e.g. being prescribed a new medication. This may confuse the individual with memory loss. Furthermore, though routines may have been performed for years, short-term memory loss can prevent an individual from remembering whether they have already performed a given task.

### **5. Where are the tasks performed?**

From our interviews, the majority of tasks seem to be performed at the home of the individual with memory loss, e.g. taking medications, eating, and bathing. There are also some daily tasks performed outside the home, such as grocery shopping or doctor visits. From our interviews, these outside visits were commonly accompanied by a caretaker.

### **6. What is the relationship between the person and data?**

We are not completely sure what kind of data we will be collecting from individuals with memory loss. However, we want our data collection to be effective in devising a solution while also allowing the individual as much privacy as possible. We are currently thinking of devising a solution that collects data from objects around the individual's environment instead of data from

the individual itself. For example, we may collect data from appliances or items that the individual regularly uses.

### **7. What other tools does the person have?**

Our interviews have revealed that existing tools to assist individuals with memory loss are fairly archaic. Current tools include pen and paper to write down reminders and information, phone calls from the caretaker to the individual in order to ensure that daily tasks are successfully completed, sticky notes, and in-person reminders. Photos and photo albums are also used in order to recall information, with information sometimes being written down on the photo itself.

### **8. How do people communicate with each other?**

Based on data from our interviews, caretakers and the individual with memory loss primarily communicate in-person or on the phone. The individuals with memory loss seem to tend to not have a lot of experience with technology, so verbal communication seems to be the preferred method of communicating. However, our project is shaping up to focus more on the individuals with memory loss and their interactions with the environment, so we will also be examining non-verbal communication methods.

### **9. How often are the tasks performed?**

Some tasks, such as taking medications and eating, were reported to be performed on a daily basis. Other tasks, such as grocery shopping or visiting a doctor, occurred more irregularly, such as weekly or monthly.

### **10. What are the time constraints on the tasks?**

A few tasks are very time sensitive, such as taking medications, which may have to occur at a certain time every day (e.g. one of our participants took care of an individual who had to take blood-pressure medication every day during lunch). Other tasks seem to be more flexible, such as shopping.

### **11. What happens when things go wrong?**

In general, if an individual forgets to perform a task, it will just be forgotten about and remain unperformed. Depending on the task, this could have varying consequences. For example, with forgetting to take medications or forgetting about a doctor's visit, an individual's health may be negatively impacted.