The Audience and Motivation
I’ve once volunteered in the association of people with dementia for almost three
years, and the older adults with dementia I met rarely use the cell phone or any other phone system. The biggest reason they don’t use the cell phone is they “cannot” use the phone. It might be kind of unbelievable for us, but older adults with dementia got difficulty completing the simple task of dialing the number. First, they cannot remember 10 digits in their short-term memory. Also, even they write down the numbers on the note, they have to keep looking it up to keep track of what numbers they already dialed. And it often took too much time; as a result, they got to redial the phone number again and again. In addition, the menu system of the current cell phone is too difficult for the older adults with dementia to operate. They often “got lost” in the menu system and lose the awareness of the task.

Thus, my design is especially for the population with extremely lower or immature cognitive abilities, such as short span of working memory, short span of visual attention, and lower psychomotor skills, and lower verbal abilities. The possible audience focuses on the people with dementia, Alzheimer’s disease or brain malfunction and children under 7-year old. Those groups of population got poor working memory and cannot remember 10 digits of the phone number. The shorter attention span made them hardly to remember which step they were doing along the complicated operations of current cell phone. The poorer psychomotor skill limits their use of deliberate keyboard or panel stick to control the phone. The poorer verbal limits their understanding of sophisticated instructions and hierarchical menus. However, these groups of population got a higher rates of getting lost as well as a higher need to keep contact with their close others; thus, it’s necessary and helpful for them to own and use the cell phone. Previous studies showed that older adults with dementia are prone to get lost than healthy older adults. This design is to reconstruct the current cell phone for these people with easier interface, the profile of these people are discussed below.

- **Profile of the Audience and Focus Features of the Design**
  1. Fewer but more important networks

    Older adults with dementia and little children didn’t keep the huge amounts of networking as others did. The most important connections are their family members. For little children, the most frequent connections are their parents. In addition, their teacher in the kindergarten or grandparents might be their possible connections. For the older adults with dementia, the most important connections are their spouse or their children. Then, their doctors or carers might contact them more often. Thus, the design of the new cell phone doesn’t need the large lists of phone books. Instead, the design will make the most frequently contactors much more easily to reach.
2. Reduce the steps of “dialing phone numbers” or “searching the numbers”
Older adults with dementia and little children have shorter span of working memory; thus, to enter the 10-digit phone number or to look up the phone number would be really difficult for them. Even we saved the phone number in the phonebook; it would be more difficult for them to look for a specific number among a long contact list. For example, they might forget who they are calling while searching the phone number. So do the little children who haven’t developed the mental rules to memorize multiple items. Thus, the design should change the dialing more intuitive and lower mental-workloaded.

3. External supports to aid situation awareness
Older adults with dementia would easily lose track of the current activity. For example, if they intend to connect to the voice mail, they have to dial the number, enter the password, follow the unnecessarily long instructions, and then finally listen to the message. However, there is no external aid to help patients with dementia to maintain their situation awareness. In addition to the patients, little children cannot concentrate on the task for too long either. Thus, they may need extra help to complete this kind of multi-step tasks.

4. Intuitive operation
For older adults with dementia or little children, they didn’t use the electronic products as often as younger adults did. The anxiety, lower self-efficacy or unfamiliarity of using electronic technology would influence their willingness and capability of using the cell phone. Thus, the design should follow the mental models of older adults or little children who don’t have the interactive machine model yet.

5. Other important functions
As we mentioned before, there is a need for this population to use the cell phone because of the higher rates of getting lost. However, they rarely need other functions in the current cell phone, such as games, the internet, camera, and walkman. Instead, they may need the GPS to assist getting their way home or let their family find them. Thus, we enhance the usage of GPS in the new design, but remove other unnecessary modules.
● **External features of the design**

1. **Wearable**
   Older adults with dementia and little children usually forgot things and lost their properties; thus, the design of cell phone is wearable. The speakers of the cell phone just look like the dedicate bracelet which users can wear them in most of the occasions. A portable earring for the earphone is also involved.

2. **Related to himself/herself**
   For older adults with dementia, it’s important for them to relate him/herself to the object; thus, they won’t forget how to use or what is it that quickly. Research showed the ability of word recognition declined more quickly then face recognition for the patients with dementia. Thus, instead of using the caller’s names, we use the pictures to represent their contactors. As long as patient cannot recognize the current picture of their families, it’s always easy to change the current photo by the old pictures. For the little children, it’s reasonable to put photos instead of the verbal since they cannot read.

3. **Metaphor of the sea shell**
   There is always a saying that people can hear the voice of the sea from the sea shells, and once you heard the beautiful voice of the sea, you’ll never forget. We use the shell to metaphor the cell phone which people got an intuition to listen to the sounds from the hole. The size of our design is certainly not the smallest, but the joy and excitement to hear a sound from a shell-like container is more attractive.

4. **GPS**
   There is an electronic touch pad that always showed the location of the users and their way to home. Thus, users can use the electronic map to find out where they are and where they are going to. Also, it’s possible for the family and parents of the patients with dementia and little children to track where they go. Thus, it can prevent the users getting lost also.

5. **Magic Five**
   In our design, users can choose five people who they contact most frequently. And we’ll personalize the cell phone of each user with their five close others and preferred ring tones. Usually, parents or kids, spouse, doctors, primary carers and police are recommended call lists. The fewer but more important contactors will reduce the efforts of visual search and working memory.

6. **Light**
   If others call in or users call out, the speaker would be shining. And, if the conversation is on, the speaker would continue lighting instead of shining. If there is no activity interacted with the speaker, the lights remained off. The light
system would cue the situation awareness for the users.

7. Intuitive model

We use the “lid open” and “lid close” to represent the beginning and the end of the phone conversations. If users open the lid, the phone would either be picked up or dialed depending on their actions. If users close the lid, the phone would be ended.

**Tasks**

1. Pick up the phone and answer the phone
   When the phone rings, users can see the specific speaker shining and singing. (If there are two people called the user at the same time, only one speaker will ring based on the importance of the contactors.) Then, users just need to open the lid of the speaker and start conversations. To end up the conversation, users just close the lid. (The importance is adjusted by the frequency of calling.)

2. Make a phone call
   To make a phone call, participants just open the lid of the speaker which they planned to talk to. Then, the phone will directly dial the number of targeted contactors. To adjust the volume, users can scroll the stick beside the speaker.

3. Listen to a message
   If there is a voice message, users can see the speaker lighting with the lid closed. Thus, users can open the lid to listen to the voice message directly.
Scenario

TURN ON THE PHONE!

End Up The Conversation.