

Rewind; A brain-training quiz platform for people living with dementia.

A Smart TV application to ensure dementia patient's independence and wellbeing as well as reduce burden on caregivers.



Rewind
- A brain-training quiz platform
for people living with dementia.

A Smart TV application to ensure dementia patient's independence and wellbeing as well as reduce caregiver burden.

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Acknowledgement

Big thanks to my grandmother Panju, mother Euisuk, father Hosun and my sister Roselina for generous support to completing this project. I hope we could happily manage this tough journey.

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Thanks to my best friend Jangpers and Monbokchi for amazing advice and inspiration.

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0-Introduction / Summary

Assistive technology for improving the care journey of dementia patients in the United Kingdom.

This graduation project has suggested a possible future solution for people with dementia and Alzheimer's disease in the United Kingdom. In the UK, the service around dementia is well organised and easy to access. However, as technology advances, which offers an easier way, society should come up with a new idea for dementia care.

The dementia care journey is tough for patients and families. Due to the ageing population, the number of dementia patients is increasing. Therefore, the living environment of dementia patients becomes more diverse. Ensuring patients' independence has become a vital part of the caregiving journey. Along with this phenomenon, the importance of remote care has appeared.

Assistive technology could offer remote dementia care. To find a way to apply technology that naturally permeates the patient's life, co-design activity and iterative interviews were conducted. The design research process has been followed by the 'Double diamond' to create a dementia-friendly design.

Societies and companies could create values from their relations of connecting local communities. Iterative desk research, field research and interviews have driven this project into a value-centred design. Becoming a 'dementia friend' and joining a 'dementia friend information session' supported by the Alzheimer's society offered me to gain a new perspective from the social aspect.

This service is comprised of features to improve the quality of your life, and also provides links to services that offer in the community. With the circulating system design, the quality of service is continually improved, and the solutions can be derived to improve the wellbeing of people with dementia around the world.

1-Project Background

1.1-Contextual Research

This project started with observing users to gain an empathic understanding of the problem this project will try to solve. Shadowing their experiences allows us to be immersed in the user's feelings, thoughts, issues and challenges, and this became the starting point of the project.

1-Contextual Research

1.1-Observation & Shadowing

1.2-An Initial Interview

2-The Five Whys

3-Research and Design Process

1.1.1-Observation & Shadowing



My grandmother and Me

Dementia is one of the most common diseases among older adults. Also, my grandmother was diagnosed with dementia 4 years ago. My grandmother has lived in her home for decades; therefore, considering her situation and doctor's advice, our family decided to keep her living environment as long as possible because the home environment will feel safer and more familiar to her. Every weekend, my mother takes her from her home to our house to have time with her.

Last Easter holiday, I was at my home, and I saw my grandmother could not recognise where the toothpaste and toothbrush were, even though they were just in front of her. So I thought, 'How can she live alone by herself even she could not recognise several essential articles in daily use?' So I did an observation about her daily life in our family's house.



Grandmother is looking for objects

Grandmother is looking for objects

1. Project background

Here are key findings from observations and shadowing.

Key findings

She usually spends the time watching TV. She loves watching the news and TV dramas. Also, she sometimes read newspapers. But, she didn't remember the contents of what she has read or watch.

She can do most of the everyday tasks with some directions of our families. Such as there's towel in front of you, the pink one. After then, she could find them.

She spends 30mins for solving math quiz book which designed for elementary school students. Afterwards, my mother checks the answer. This activity is for training her brain to slow down memory loss.

She sometimes walks around the park with our families. Also, it's dangerous because she has a risk to get lost.

She has to take pills every day at the same time. Mobile phone alarms help her to recognise pill times.

Empathy Map Canvas



Visualising and categorising user's behaviour and environment based on my observation help me to gain a deeper insight into the user.

1.1.2-An Initial Interview

Initial interview was conducted with my families to figuring out what she is doing during the weekdays while she stays in her home.

Key findings

Every morning, she visits the dementia care centre around her home. She spends 9 am to 6 pm. According to dementia progresses, she needs someone to wake her up and bring her to the care centre so that our family hired a social worker to help her while she is at her own home.

In the care centre, they organise several activities such as music, art, exercising and so on. We registered the care centre because we need someone to take care of her during the weekdays and provide many activities for slowing down memory loss.

When she comes back to her house from the care centre, she usually spends her time watching TV and solving math quiz book so that mother could check it later. However, my mother is always wondering what she is doing in her house alone.

Every Monday, my mother visited my grandmother's home for cleaning. Because she is not able to clean up the room by herself.

Based on the observation, shadowing and initial interviews, the research area was focused on dementia patients who live alone. It is evident that they have to keep their living environment as long as possible, but they have difficulties with everyday life. However, there are opportunities to support their independent life.

1.2-The Five Whys

The Five Whys is asking questions using the user experience to identify the underlying causes and motivations of external phenomena. I asked myself with 'The five whys' based on my observation in the empathise stage to define next research stage.

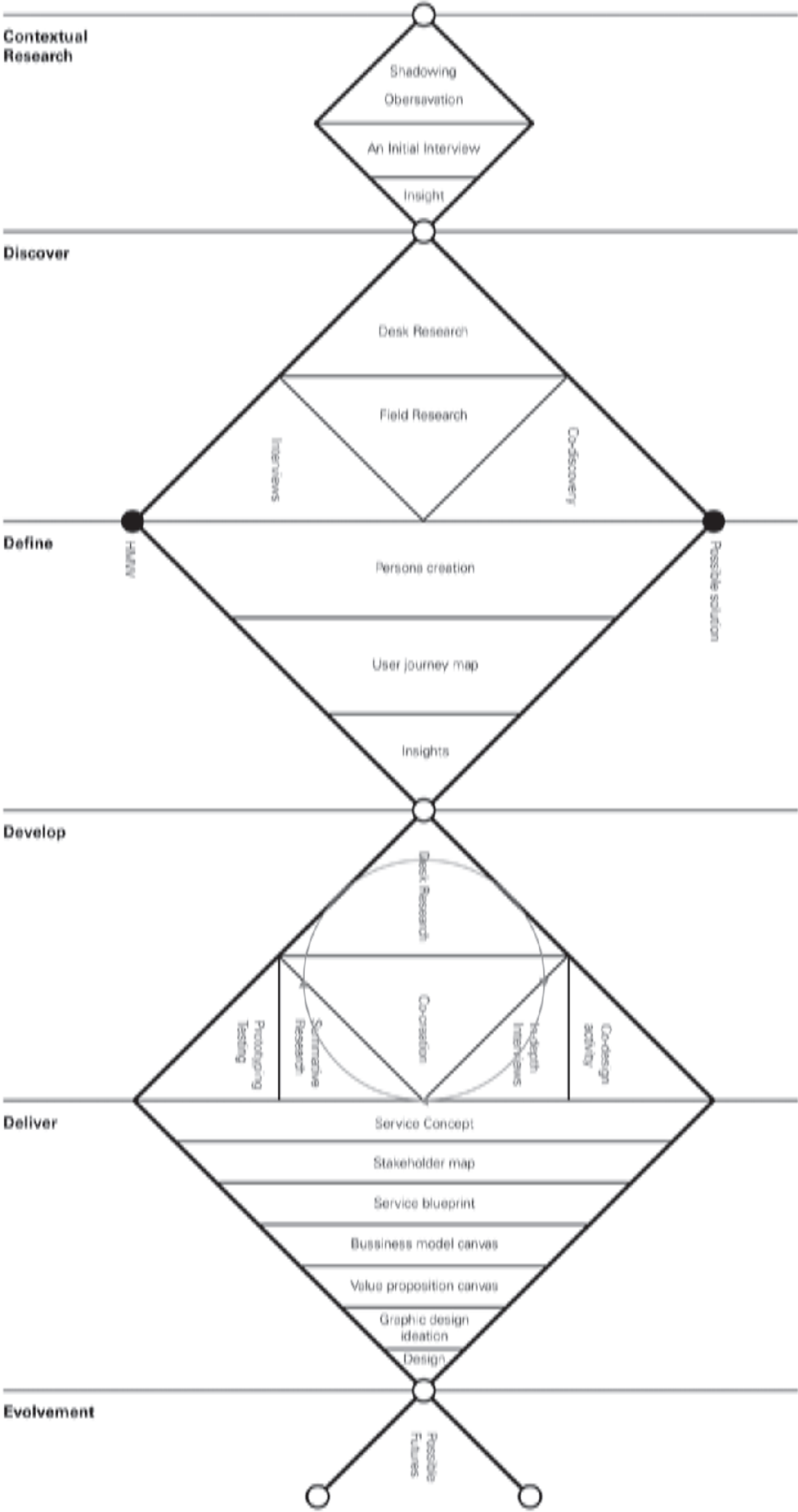
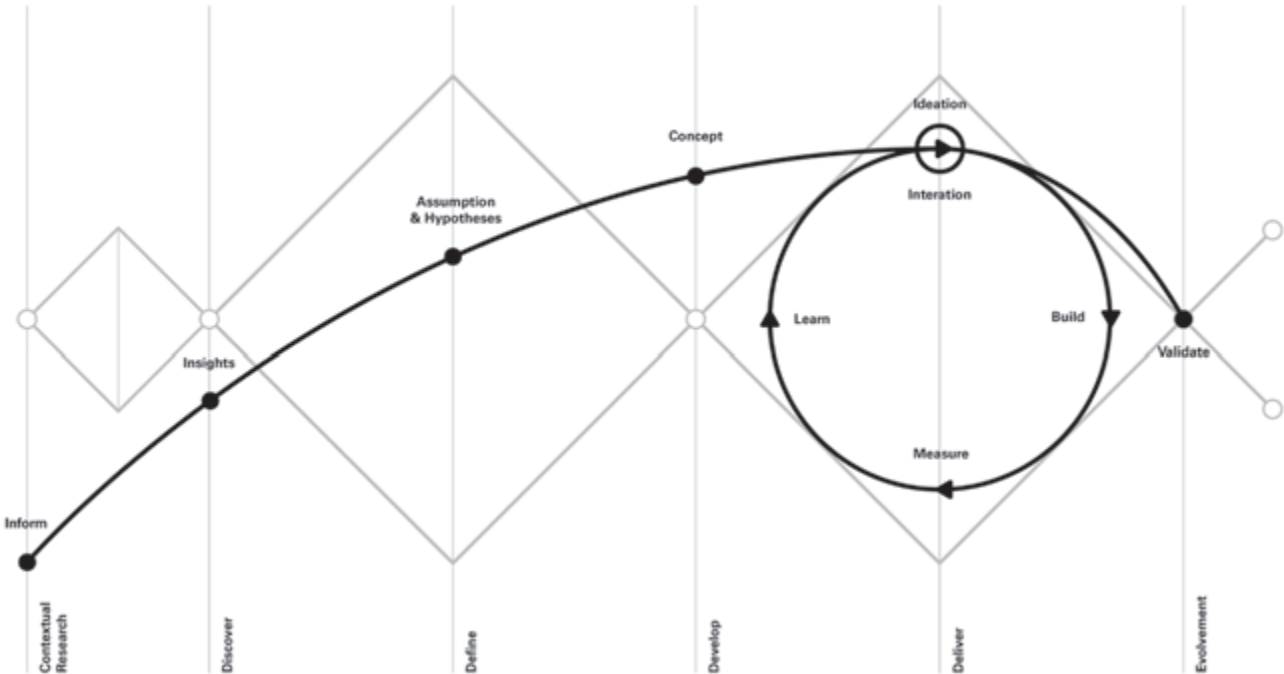
Why?

1. Why my grandmother who diagnosed with dementia lives alone?
- Because she is attached to her home.
2. Why it is important?
- Because it is good for dementia patients to keep living in their home.
3. Why it is good for them?
- Usually, they have live decades before they diagnosed with dementia so they will feel safer and familiar in their home environment.
4. Why they feel unsafe outside from their home?
- Because of the dementia symptoms.
5. Why dementia symptoms makes patients life more difficult?
- Let's find out in the next step.

1.3-Research and Design Process

The design process follows the double diamond process. This project started with the observation of a personal situation. After that, it was divided into four phases, repeating divergent thinking and convergent thinking. Along with this, practical service design methods will move a project, such as personas, user journey map, stakeholders map, and so on.

From identify the problem and desired outcome to develop the service



2-Discover

Discover target user group, as well as their needs and pain points, and gain insight from them.

- 1-Desk Research
- 2-Field Research
- 3-Target User Interviews
- 4-Co-discovery
- 5-Insights
- 6-HMW
- 7 Possible Solution

2.1-Desk Research

Step back from the previous stage; the first desk research focuses on specific background context, understanding dementia diseases, patients' and carers' current situations for discover pain points, with the need to explore new perspectives around dementia.

"Soaring rates of dementia and other neurodegenerative diseases constitute one of the most pressing public health challenges of the present era, and this will become even more challenging as the population ages"

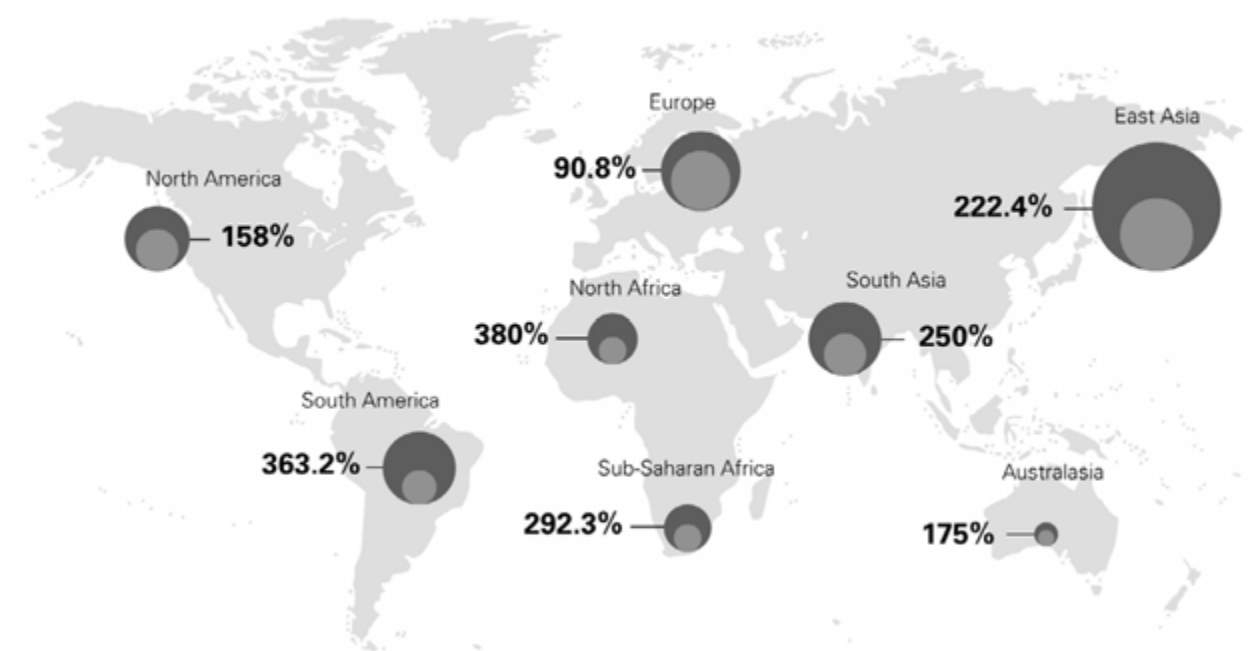
Robert Levenson, a psychology professor at UC Berkeley (Anwar, 2017)

2.1.1-Dementia Is A Global issue.

**People with dementia today
- 44 Million**



% increase by 2050



850,000

people living with dementia in the UK.

By 2025,

over 1 million

people could have dementia in the UK.

By 2050, this figure will exceed

2 million.



Dementia is a global issue because of the ageing population. Almost 50 million people around the world have dementia, moreover, it will be 135.5 million in 2050. In the Age International website, Martin Prince said dementia has different types because brain functions are selectively affected. Moreover, as dementia progresses, all functions of the brain become more impaired, including memory, communication, learning, comprehension, and judgement. (Ageinternational.org.uk, 2018) These symptoms make patients' everyday tasks more difficult.

There's no cure for dementia; it just progresses. Therefore, caregivers have behavioural disturbances such as denial, anger, social withdrawal, anxiety, depression, exhaustion, sleeplessness, irritability, and lack of concentration, as well as health problems, because of a high level of stress. (Alzheimer's Disease and Dementia, n.d.)

However, being diagnosed with dementia doesn't mean you have to give up your independence.

2.1.2-Dementia Patient's Independence

However, being diagnosed with dementia does not mean they have to give up their independence. About one-third of all people with dementia live on their own. Moreover, 85 per cent of people would want to continue living at home for as long as possible if diagnosed with dementia. (The Unforgettable Blog, 2018) In the early stages of dementia, most of them can continue living at home and enjoying life the same as before they were diagnosed with dementia.

Living Alone with Dementia



1/3

people with dementia
live on their own



85%

people would want to
stay living at home

“85% want to stay at home, less than half believe it is possible”-The Unforgettable website

However, as the illness progresses, they will need an increasing amount of help in day-to-day life. However, if patients and carers are eligible, there are many support services, including financial support from the local social services department and health and social care assessment. (The Unforgettable Blog, 2018) Also, there are many useful dementia products such as easy-to-use mobile phones or digital reminders that support patients' independent life. However, in the end, they have to move to a care home or hospital for their safety.

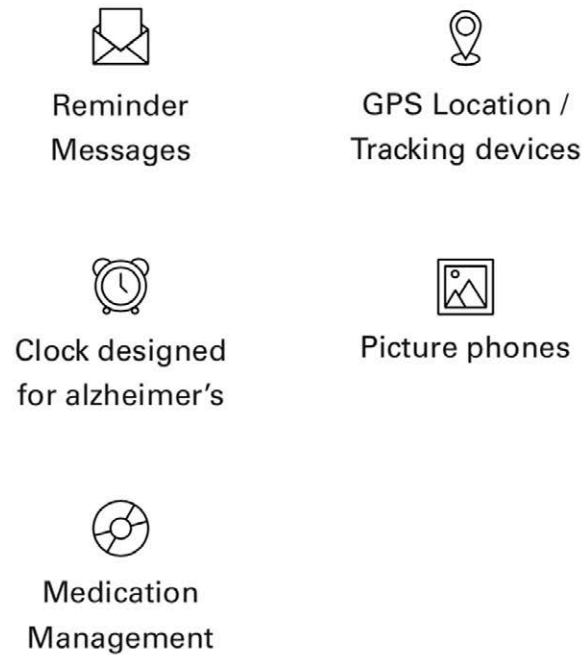
2.1.3-Assistive Technology and Dementia

Technology appeared as a new solution for dementia patients. Assistive technology for dementia patients is a broad term that describes objects, products, devices, and systems that assist in ensuring patients' safe life and well-being at home or in a residential care environment. (lcarehealth.com.au, 2014) In this context, Alzheimer's Society highlighted the importance of assistive technology. It can maintain patients' independence and safety and keep them socially involved. Also, caregivers found it offers them support and reassurance. (Alzheimer's Society, n.d.) On the Alzheimer's Society website, we can see the advantages of assistive technology. It can promote patients' independence and autonomy, improve confidence and quality of life, manage potential risks around the home, maintain patients' abilities and independent living at home for as long as possible, help with memory and recall, and provide reassurance to carers, helping them feel less stressed. (Alzheimer's Society, n.d.)

However, there are some barriers and concerns about using assistive technology. Some people are concerned that this technology might reduce human contact or make patients' lives more difficult. Furthermore, most of the older adults are not familiar with digital devices. However, if we find the best way to apply it to technologies pervasive in their lives, assistive technology can be an effective way of combining high quality, consistent care and support. (lcarehealth.com.au, 2014)

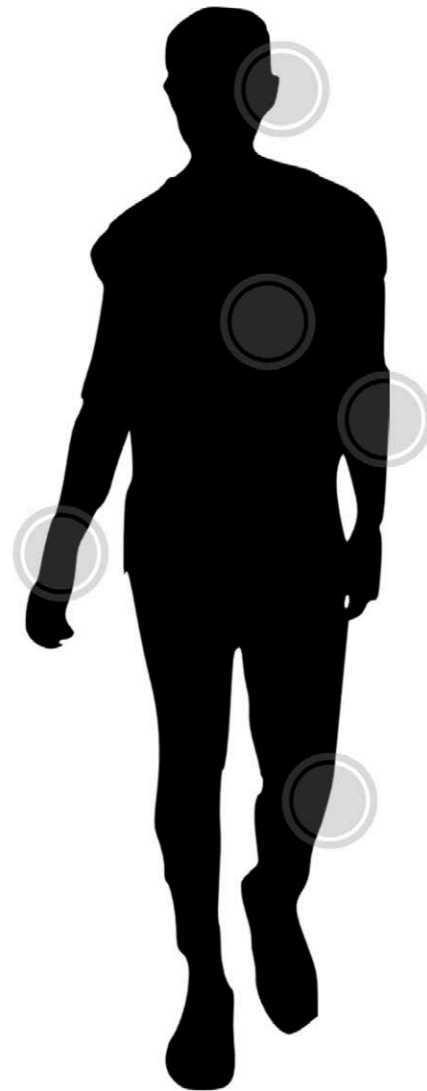
*“Assistive technology can give people with dementia help and support to remain independent, safe and socially involved.”
- Alzheimer's society*

“Assistive technology for person with dementia can reduce caregiver burden” - Dementia care



Impact

Help ease anxiety, establish routine.
 Improve the quality of life for everyone involved.
 Promote independence, autonomy.
 Manage potential safety risks around home. Reduce caregiver stress/



2.1.4-What Makes Dementia Patients' Activities of Daily Living (ADLs) Difficult?

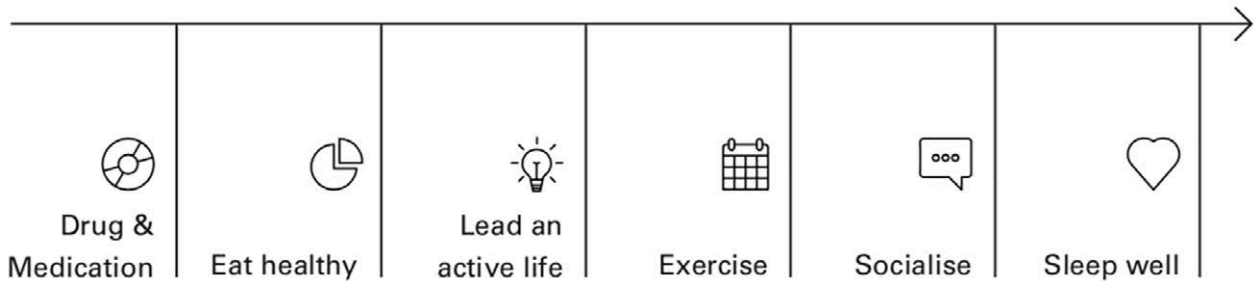
The patients' brains are impacted by dementia, which makes patients' activities of daily living (ADLs) difficult, including bathing, cleaning, grooming, dressing, eating, and toileting. There are some reasons for difficulties in daily living. On the Verywell Health website, Esther Heerema divided the reasons into six categories. Firstly, executive functioning makes sequencing, planning, and organising-multiple step activities-difficult. Memory loss is the most common symptom of dementia, and it makes patients forget to do their tasks. Poor decision-making skills make them forget to wear a coat in winter. A lack of attention causes challenges in completing activities. Also, dementia affects their behaviours and personality. Visual-spatial changes jeopardise their perception so that patients become uncertain as to which container is the toilet. (Verywell Health, 2018)

“Patient’s memory loss makes their Activities of Daily Livings more difficult. They start forgetting things they knew before.”

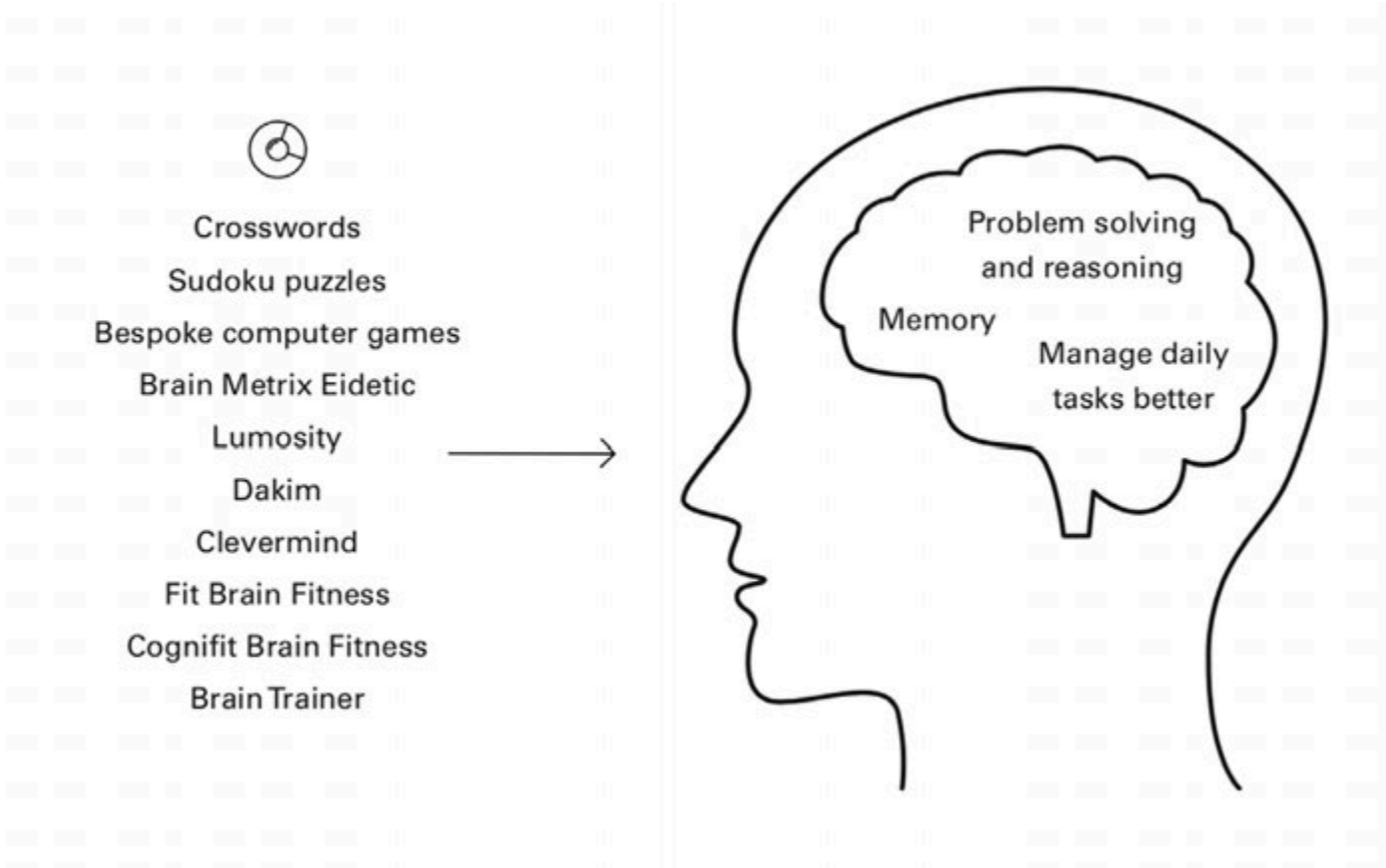
2.1.5-How Can We Slow Down Memory Loss?

There are some recommended activities for slowing down memory loss. For example, taking medicine every day at the same time is essential. Also, arts and crafts, music, and simple exercises can be helpful. Kate Carr from Unforgettable noticed that regular exercise improves memory, reasoning, judgement, and cognitive functions because it keeps blood flowing through the brain. For arts and crafts activities that can boost mood and slow memory loss, and in 2015, the Mayo Clinic proved that these activities can reduce the risk of developing mild cognitive impairment. (The Unforgettable Blog, 2015) Also, for other activities, dominos, puzzles, and games are being used now.

The way of slowing down memory loss



2.1.6-Can brain training activities help delay memory loss of dementia?



One web article named 'Brain Exercises and Dementia' from WebMD said one interesting study. This study focuses on the impact of brain training sessions among older adults, and it aims to aid memory, reasoning, and speed of processing information. As a result, participants' skills and Activities of Daily Living (ADLs) were improved. In the case of dementia and Alzheimer's, one study found that brain training delayed declines in thinking skills, so the symptoms did not show up until later. (WebMD, 2016) Based on this article, these activities for the active brain are not a sure way to prevent dementia or Alzheimer's; however, they may contribute to delay symptoms or make one's mind working better for longer.

Dementia caregivers are **3x more likely** to feel extreme stress from their caregiving responsibilities than other caregivers. (Assistance, 2017)

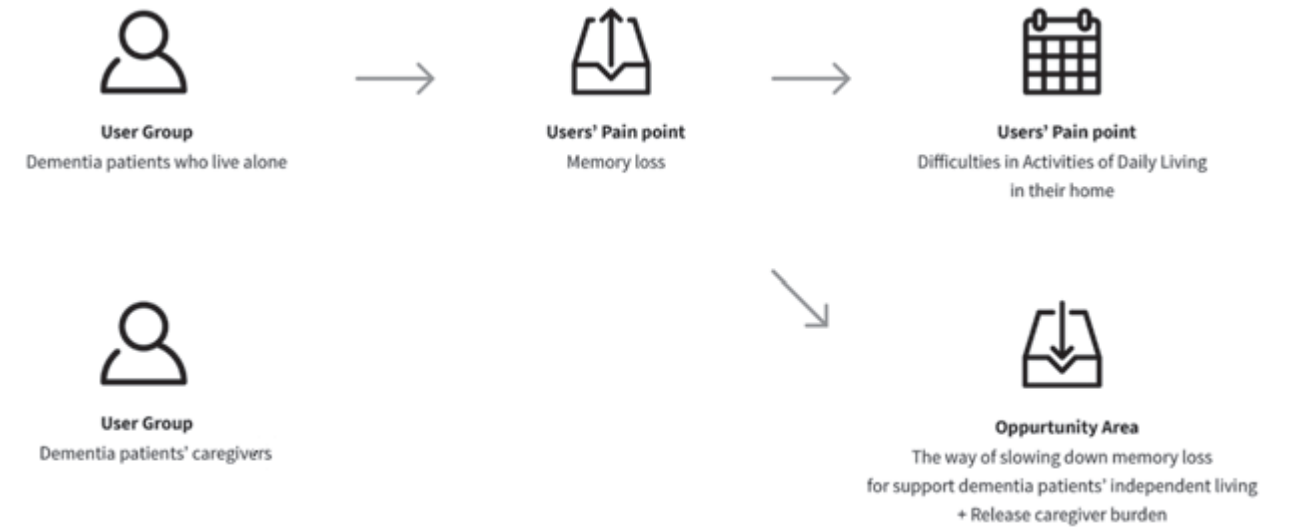
Dementia caregivers are **7x more likely** to experience daily physical, emotional and mental exhaustion from caregiving than other caregivers. (Assistance, 2017)

26% of dementia caregivers spend more than 25 hours a week caring for their loved one. (Assistance, 2017)



2.1.8-Insights from Desk Research

User group / Opportunity area



User group: People with an early on-set of dementia who live alone and their caregivers in UK. There are 850,000 dementia patient across the UK.

Opportunities: Design the way of supporting dementia patients ADLs (Activities of Daily Living) for keep their independence and release caregivers' stress.

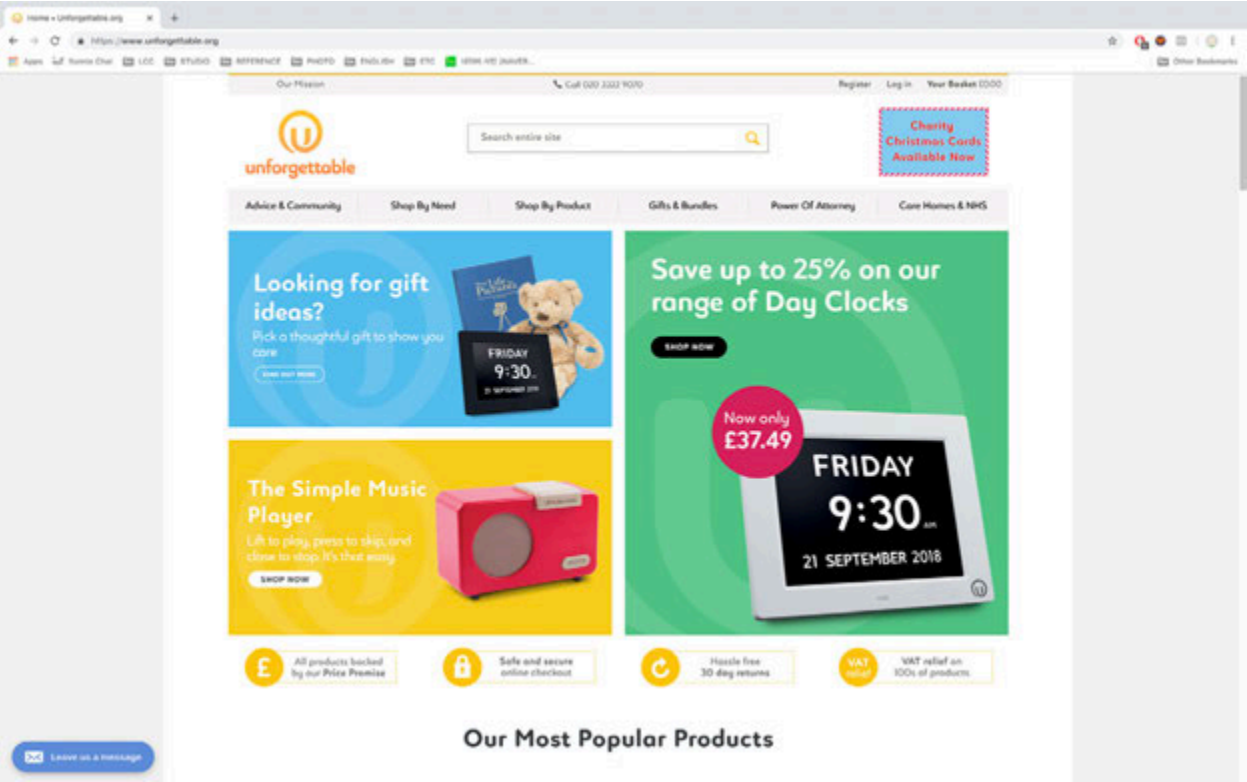


2.2-Field Research

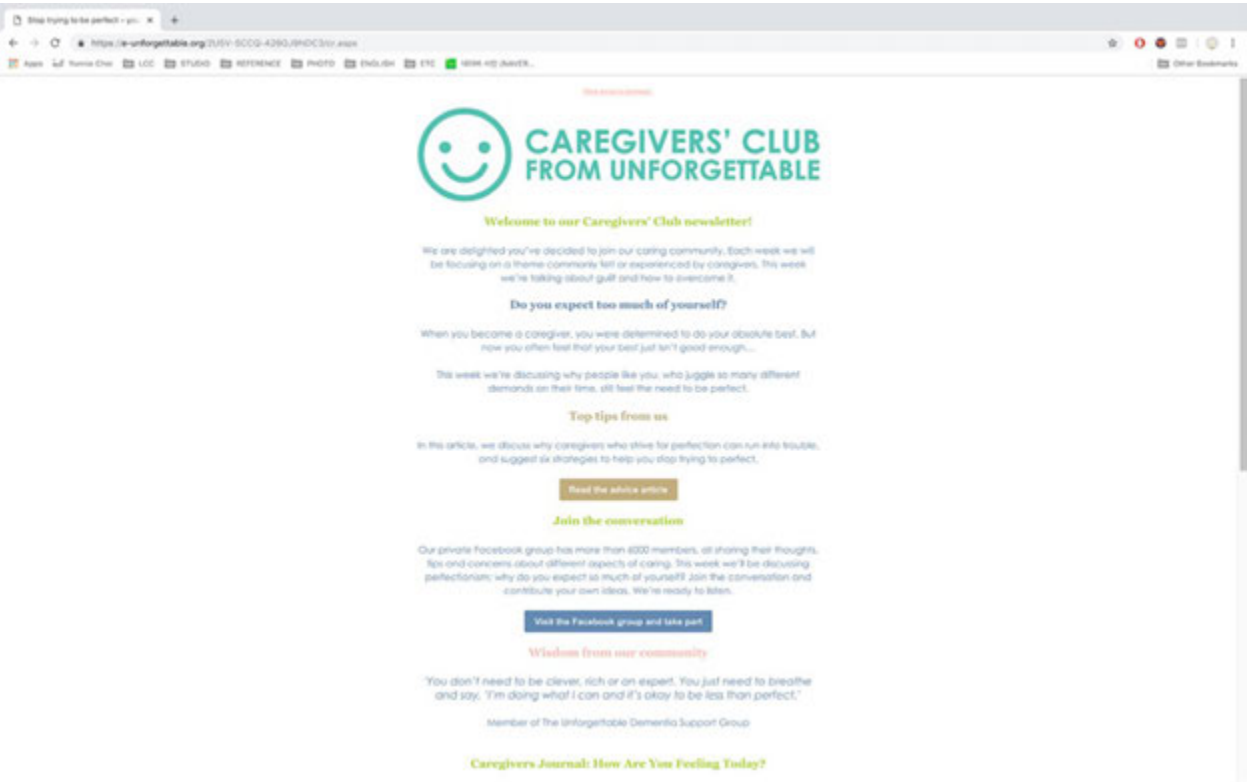
Field research is driven to observe their point of view and understand the context. By seeing and meeting people in their environment, insights have been re-framed, and new perspectives from user experience have been discovered.

2.2.1-Unforgettable Caregiver Club Event

'Unforgettable' is the company that aims to improve the lives of people who are affected by dementia and memory loss. 'Unforgettable' provides specialised products, practical advice for every step of dementia and a supportive community for caregivers. They sell products such as dementia patients' activity materials for slowing down memory loss, clocks and watches for reminding time, support for eating and drinking, kits for health and well-being, products that help with mobility, trackers and object locators, and telephones and mobiles which are redesigned for easy use. The Unforgettable blog provides a wide range of articles explaining possible symptoms, treatments, and practical information on coping with dementia.



Unforgettable website (<https://www.unforgettable.org/>)



Caregiver's club news letter

On 20th September, Unforgettable launched the Caregivers' Club. It aims to find out how the caring community might be able to help carers find support and friendship. Also, they introduced products for the caregivers to encourage them. For example, they used quotes that would encourage carers; thus, a cup they gave to people at the event read, 'You can't pour from an empty cup. Take care of yourself first.'

They also invited guest speakers to share information on their organisations, products, or services related to dementia. After the session, Remind-Me Care was examined as an excellent example of senior digital care.

Unforgettable event



Guest speakers' session



Welcome to the Caregivers' Club

Living with a loved one with a long-term condition can be a challenging experience. The Caregivers' Club is a free, confidential support group for people who are caring for someone with a long-term condition. The club provides a safe space for you to share your experiences, get advice and support, and meet other people who understand what you're going through.

Our Caregivers' Club is for you if:

- You are caring for someone with a long-term condition
- You need support and advice
- You want to meet other people who understand what you're going through
- You want to share your experiences

Our Caregivers' Club offers:

- Free, confidential support
- Advice and information
- Emotional support
- Practical support
- Access to specialist services

How to join:

Call 020 7 123 4567 or visit www.caregiversclub.org.uk

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RemindMeCare

Support for those caring for at home

Features:

- Personalised reminders
- Medication management
- Appointment reminders
- Emergency alerts

Benefits:

- Reduces the risk of hospital admission
- Improves the quality of life for carers
- Provides peace of mind

Case Study
: RemindMe Care

RemindMe care is digital software for the elderly with dementia or cognitive and learning disabilities. Simply put, this is a care SNS to reduce loneliness and improve well-being. It has many functions for patients and caregivers and can be used on a tablet or PC. RemindMe Care engages with families and builds personal profiles. Also, it provides readymade group activities, 1:1 therapy, and entertainment contents and can be integrated into Alexa, TVs, Touch Tables, built-in ReMe-Learn e-training, providing hospital connectivity and cross-generational and multi-cultural engagement.



RemindMe Care (<https://app.remindmecare.com/>)

RemindMe Care: Features & Benefits
(<https://app.remindmecare.com/>)

Features & Benefits

COMMUNICATIONS

- Remote access for family
- Family care circle connectivity
- Skype and secure messaging
- Multi-platform usability
- Alexa integrated

[Read more](#)

MY STORY

- Build Life story in media
- Remote My Story creation
- Multi-media repository
- Voice over recording
- Hard copy print outs

[Read more](#)

REMINISCENCE & THERAPY

- Discovery reminiscence
- Cognitive stimulation therapy
- Bespoke unlimited sessions
- Live notes & recording
- Reduce agitation in dementia

[Read more](#)

ENTERTAINMENT

- Hosts radio, TV and films
- Create multi-media playlists
- Schedule activities
- Accessible by family remotely
- Record notes and outcomes

[Read more](#)

MUSIC

- Create music playlists
- Music therapy
- Hold music conversations
- Attach notes & stores
- Readymade playlists

[Read more](#)

GAMES & ACTIVITIES

- Games, quizzes
- Multi-cultural entertainment
- Build your own games
- Physical exercise videos
- Yoya & meditation videos

[Read more](#)

MANAGE MY DAY

- Start my Day videos
- Remote reminders
- Calendar scheduling
- Recipes
- Key data storage

[Read more](#)

MY HEALTH PASSPORT

- My Passport health module
- Usable by all care providers
- Wellbeing reporting
- Integrates with care plans
- Doctor & hospital access

[Read more](#)

DATA SECURITY/ REMEVAULT

- Secure data hosting
- Data compliance
- Avoid repeat data provision
- Prevent exploitation of data
- Integrate with software

[Read more](#)

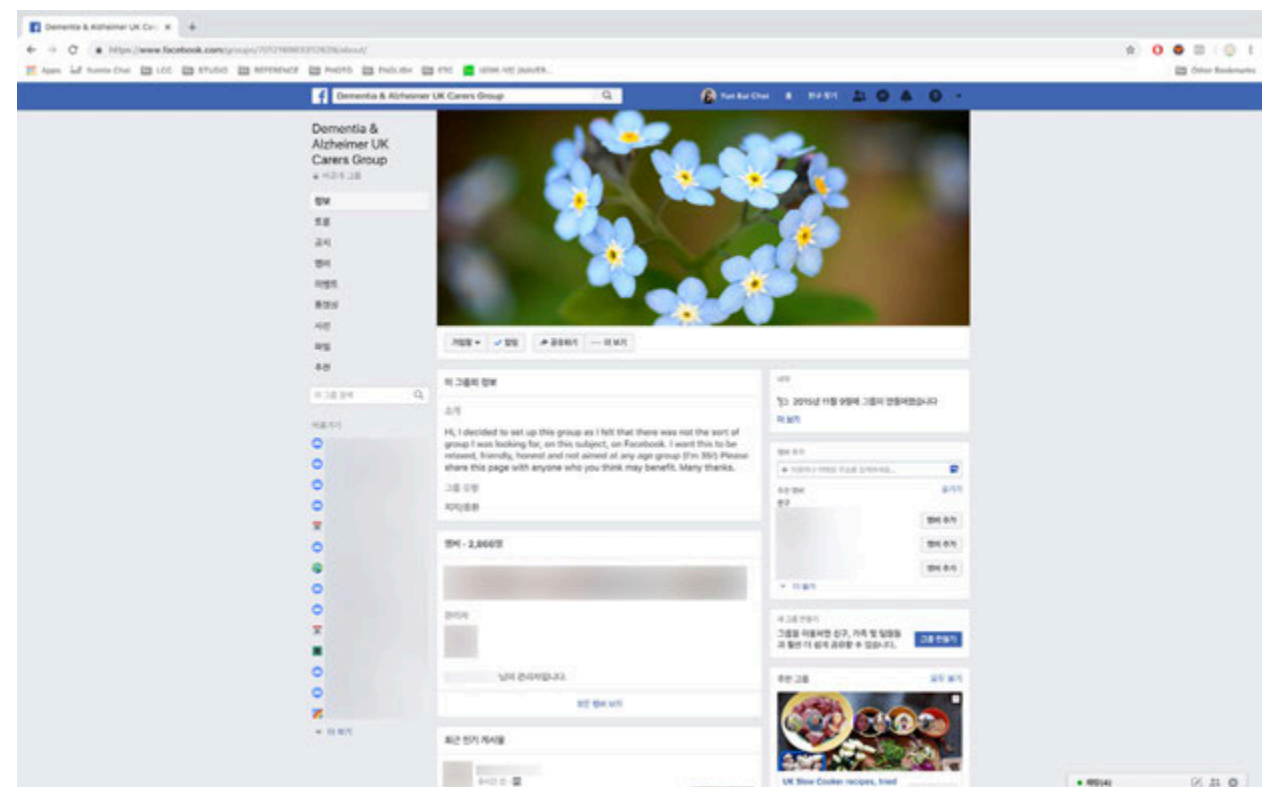
How is it different from the present project?

In the previous workshop in Age UK, most of the seniors were not comfortable with digital devices. Therefore, another delivery material was considered. RemindMe Care is not just for people with dementia. Therefore, it has many functions for entertainment for seniors. People with dementia are not able to learn new things. Therefore, while organising a suitable content for dementia patients, the company came up with a possible solution for supporting the patients' activities of daily living.

2.3-Target User Interviews

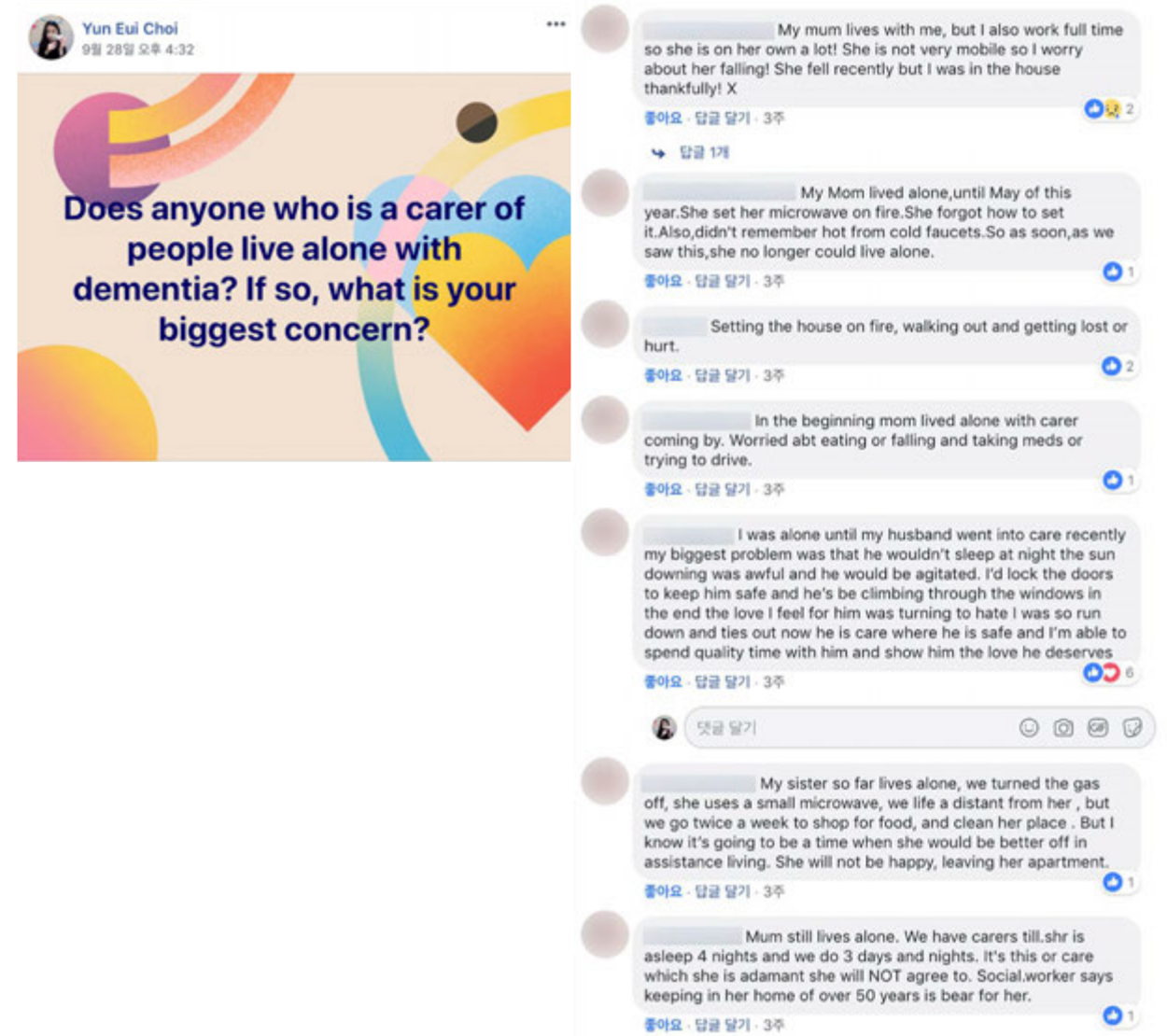
Target user interviews are the best way to extract information from real users to understand their current situations and problems and figure out opportunity areas.

2.3.1 -Facebook Group Interviews

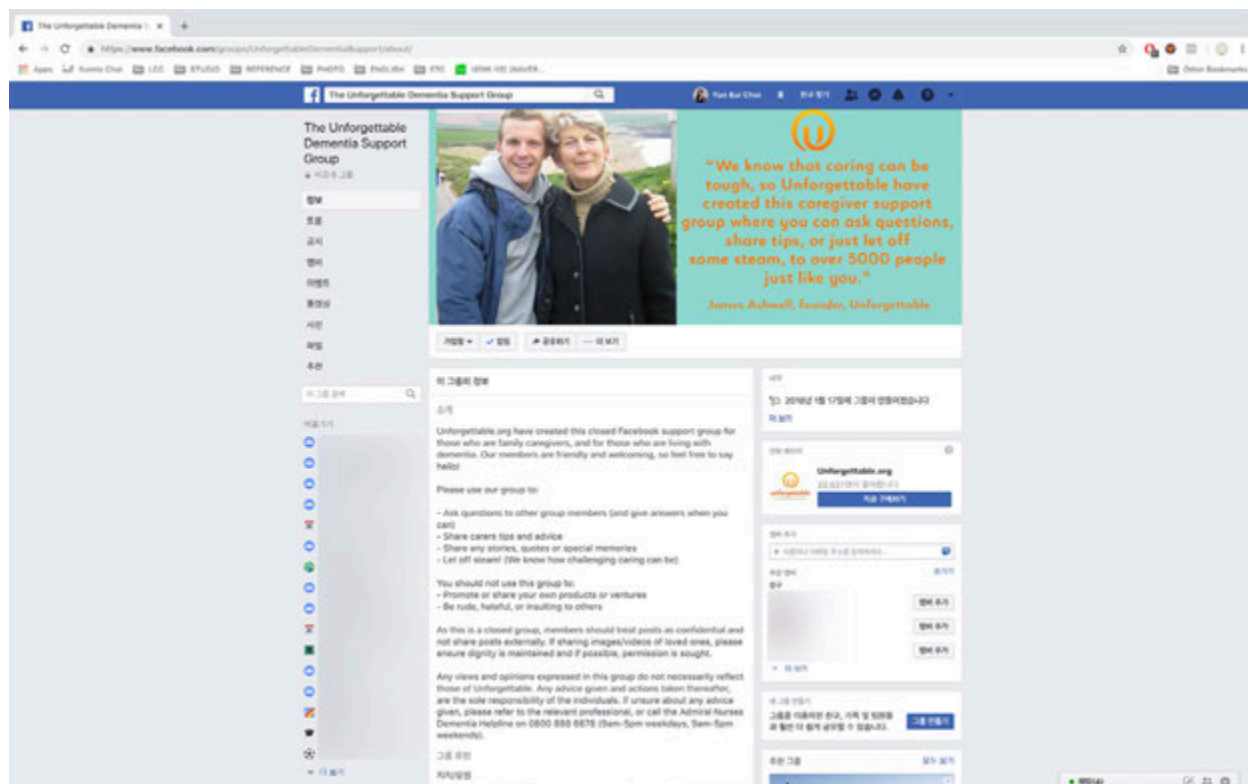


Dementia & Alzheimer UK Carers Group

Facebook groups are important communities for dementia carers or people who are interested in dementia and Alzheimer's disease. Members share their personal stories and photos, get feedback from each other, and share important quotes that encourage carers. The interviews were conducted to gain insights from specific target user groups, so that new opportunities were figured out.



'Dementia & Alzheimer UK Carers Group' has 2,874 people in the community. Some of them in the community were caring for a dementia patient who lives alone, and others live together with patients, but, they have to work full time. Thus, they have similar situations. Losing their memory makes patients forget how to manage daily life, and it causes safety issue in their home. Moreover, interviewees highlighted the importance of keeping patients' living environment. Patients may not be happy if they have to leave their space.

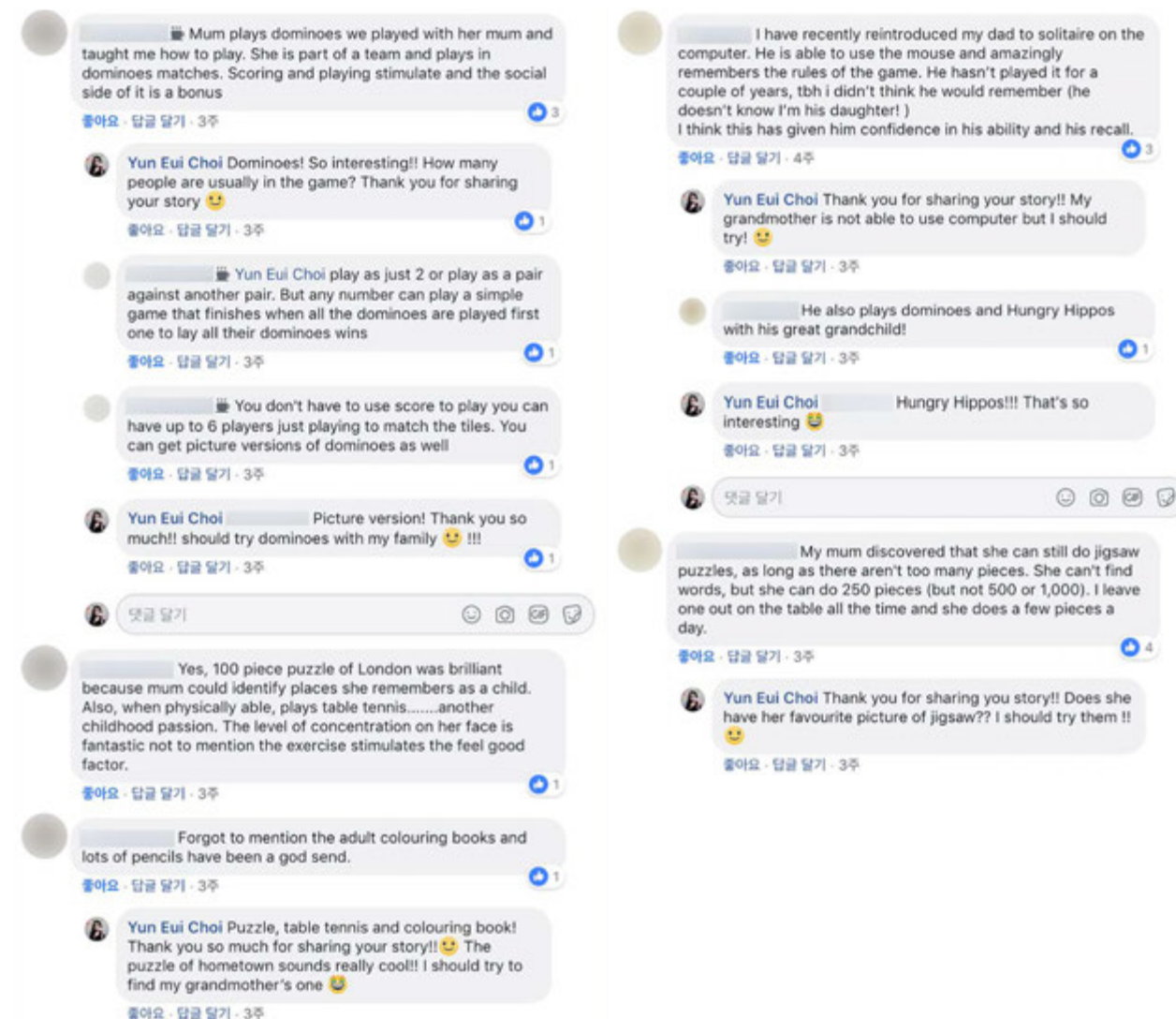
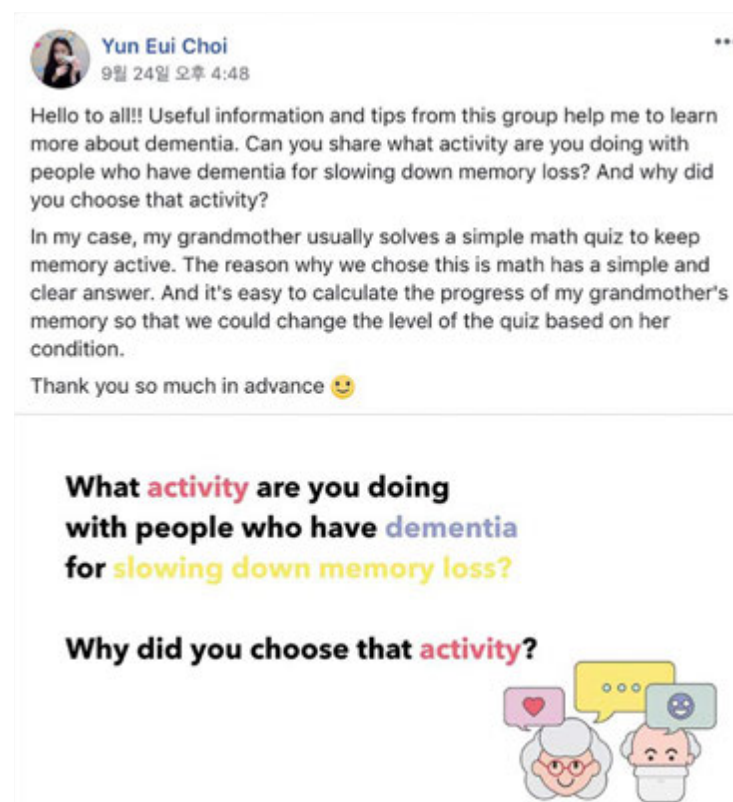


The Unforgettable Dementia Support Group

'Unforgettable.org' created a closed Facebook community group for family caregivers and people who are living with dementia. Exchanging questions and answers, sharing tips and advice, and posting individual stories and photos were conducted in this group.

In the second round interview, caregivers are conducting music and exercising activities to slow down memory loss. Some of them feel confident with using the internet, they are playing internet games, such as solitaire. Dominoes, Jigsaw puzzle, 100 piece puzzle of London, and adult colouring book. They also play table tennis and Hungry Hippos, They can be played together with families.

Dominoes and solitaire have rules for playing them. The scoring, the stimulation of playing, and the social side are beneficial for training the brain. Also, these activities and others give patients' confidence in their abilities, helpful for their recall, and bring about childhood passion.



2.4-Co-Discovery

The co-discovery activity was conducted to gain a new perspective and explore opportunities about the way of slowing down dementia patient's memory loss. This session is carried out with the caregiver of a dementia patient who was diagnosed with dementia four years ago.



Co-discovery session about the way of slowing down memory loss



Slowing memory loss is divided into two categories: activities in the home and activities in the hospital. Home activities are more focused on entertainment, socialisation, and daily living while hospital activities are more focused on assessing their condition. Co-design activities with users allow them to discover new ideas and suggest new perspectives. As a newly explored area, a cognitive assessment was recommended, which is carried out with the doctor as a tool for diagnosing dementia.

2.4.1-How Can We Measure Memory Loss?

Cognitive Assessment

This assessment covers a broad range of activities to measure someone's cognitive function. This tool is conducted during a time-limited office visit, and during the screening, a doctor can detect possible cognitive impairments so that patients could be referred for further evaluation. (Alzheimer's Disease and Dementia, n.d.) This stage is important in the dementia care journey because we can detect the symptoms earlier, which means we can get support, information and medication earlier. (Dementia.org.au, n.d.)

There is no single implicit test for diagnosing dementia. Patients and their carers should choose the most suitable test version for the health setting within which we work. (Dementia.org.au, n.d.) An example of a cognitive assessment developed by Alzheimer's Society and the Department of Health is given below.

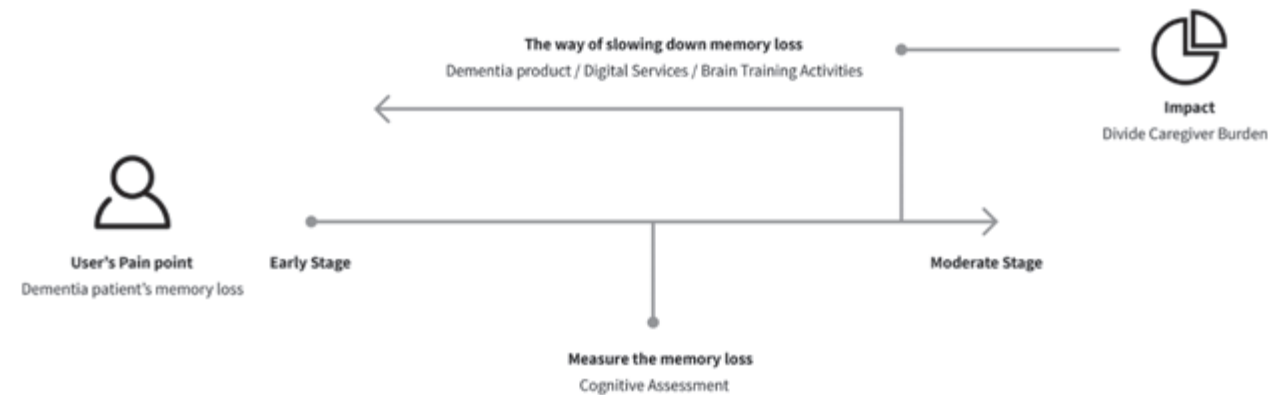
“There’s no sigle test for diagnose dementia. Detecting possible cognitive impairment is the aim of this test.”

The image displays several pages of cognitive assessment forms. The first page is the '6-Item cognitive impairment test (6CIT)', which includes instructions and a list of seven questions with checkboxes for 'Correct' and 'Incorrect' answers. The second page is the 'Addenbrookes cognitive examination-III (ACE-III) (Continued)', featuring a 'Fluency' section with a list of words and a 'Memory' section with a list of names. The third page is another 'Addenbrookes cognitive examination-III (ACE-III) (Continued)' page, showing a 'Language' section with a list of words and a 'Visuospatial abilities' section with a list of objects. The fourth page is a 'Language' section with a list of words and a 'Visuospatial abilities' section with a list of objects. The fifth page is a 'Language' section with a list of words and a 'Visuospatial abilities' section with a list of objects. The sixth page is a 'Language' section with a list of words and a 'Visuospatial abilities' section with a list of objects.

https://www.alzheimers.org.uk/sites/default/files/migrate/downloads/alzheimers_society_cognitive_assessment_toolkit.pdf

2.5-Insights

Focus area / Impact

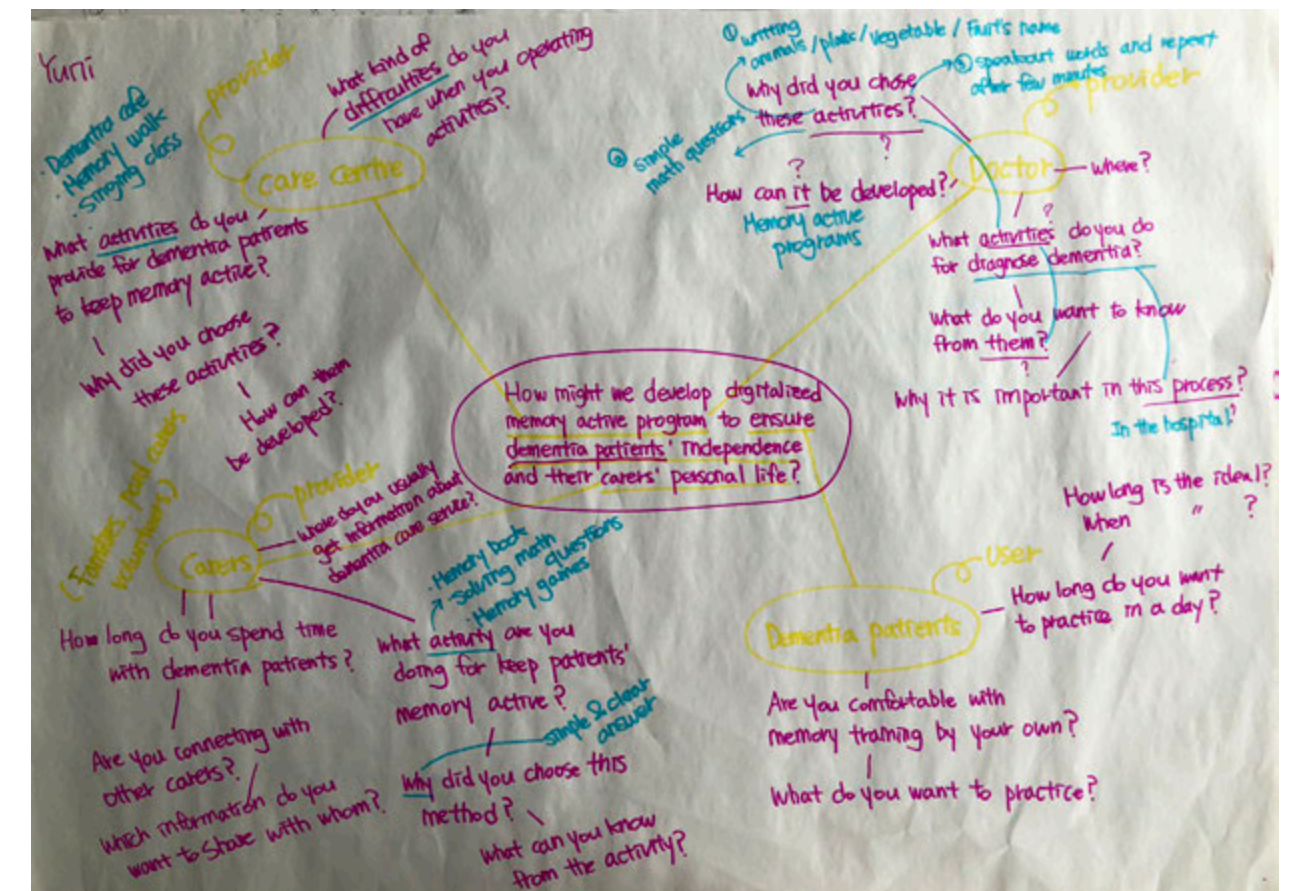


Key findings from desk & field research

Memory loss makes dementia patient's everyday tasks difficult. Dementia products, digital services and brain training & entertaining activities divide carer's work with caregivers in dementia care journey. Digitalised memory active program can be a possible solution.

2.6-HMW

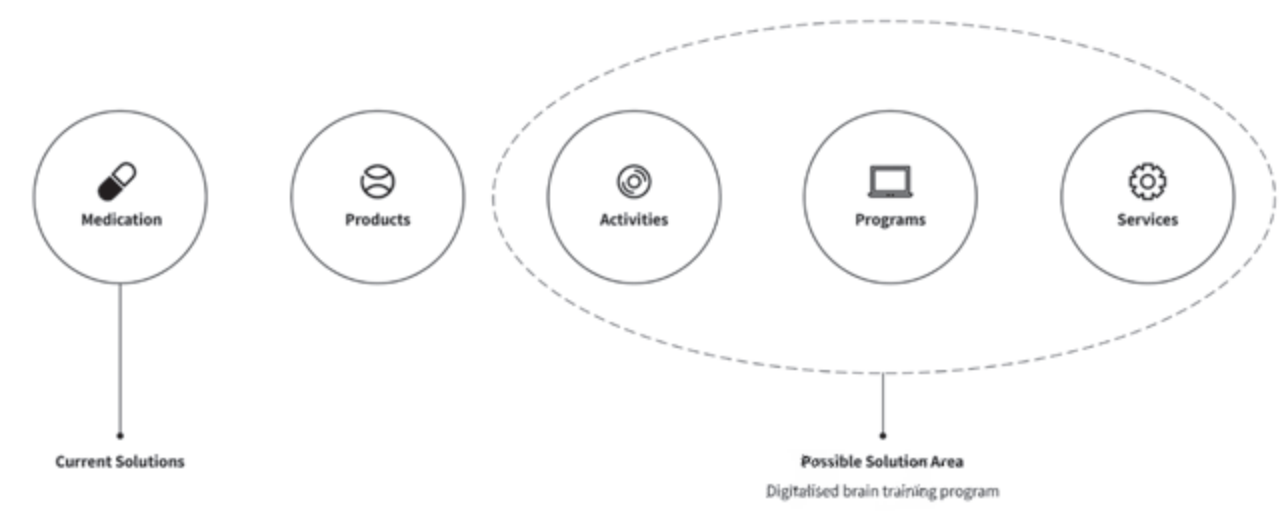
Framing the problem and challenge to explore an opportunity for the innovative solution, How Might We Question, was set up. On reframing insight statements as How Might We Question, current challenges turn into opportunities for design. This question includes a possible solution and the potential impact for user groups. (Designkit.org, n.d.)



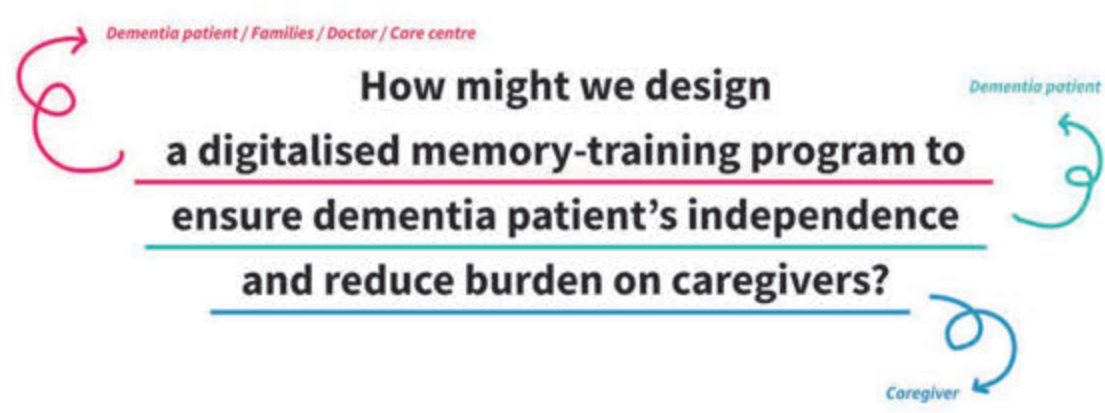
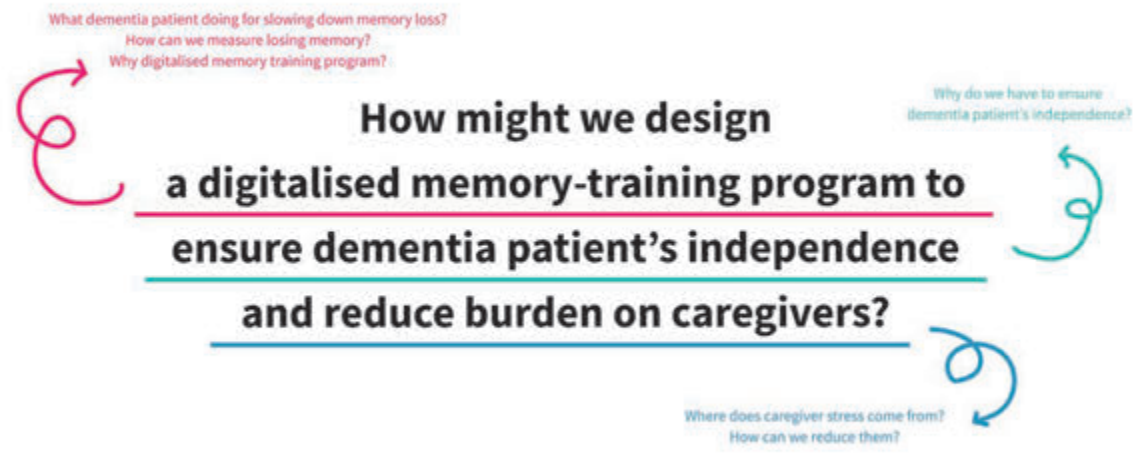
Workshop session_17th July

2.7 Possible Solution :Digitalised Brain-training Program

Possible Solution
The way of slowing down memory loss



The digitalised brain training program could be combined with features of current activities, programs and services. Medication reminders and dementia products could be connected with this possible solution.



In this workshop session, the HMW question was divided into three summative questions, which are related to particular stakeholders. The possible solution is the digitalised memory active program, and the impact of this possible solution is to ensure dementia patients' independence and caregivers' personal life.

3-Define

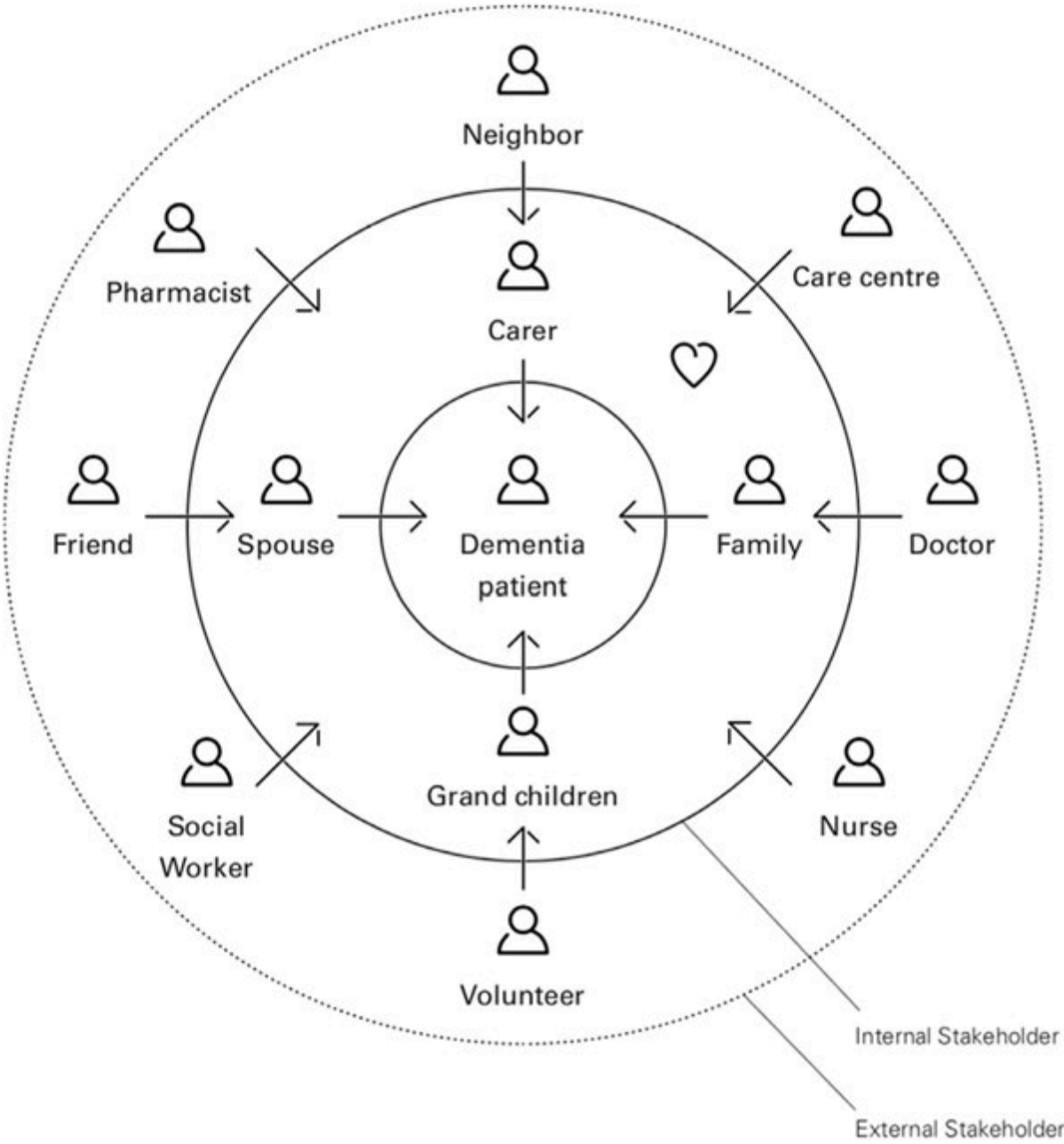
Exploring opportunity areas based on problem statements and applying them to real users' lives led to narrowing down ideas.

- 1-Persona Creation
- 2 -User Journey Map
- 3-Insights

3.1-Persona Creation

Personas are archetype profiles representing user groups, based on re-
search and interviews. After defining the opportunity area, two personas
were created to find out how this possible solution could be applied to us-
ers' lives. In this case, the primary persona represents an actual user group,
and the secondary persona represents a summative user group to gain the
most benefit from the possible solution.

Dementia caregiving
stakeholder map





“I want to keep living in my house as long as possible. I feel happier and more comfortable in my house.”

Primary persona

Linda / 78
Previous job: Teacher
Dementia patient
Live alone

- Symptom
Diagnosed with dementia 4 years ago.
- Features
Forgetfulness / Repetitive behaviour / Memory loss
- Goal
Keep reminding about essential informations for reduce difficulties in activities in daily living.
- Challenge
The way of using service.

User Story
Before diagnosed with dementia, she was such an active person. She enjoyed swim- ming, walking and travelling. And she has lived alone for decades since her husband passed away. After she diagnosed with de- mentia, she visits senior care centre during every weekday, 9 am to 6 pm. When she comes back from the care centre, she always watchesTV before she goes to bed. Also, she sometimes solves math quiz book which Jenny left in her house for training brain. Every weekend, she visits Jenny's house and spends time together. And once a month, she visits a doctor with Jenny for prescribing medication and check the dementia progress.

“How can I advice to preserve her dignity and preserve my sanity at the same time?”



Secondary persona

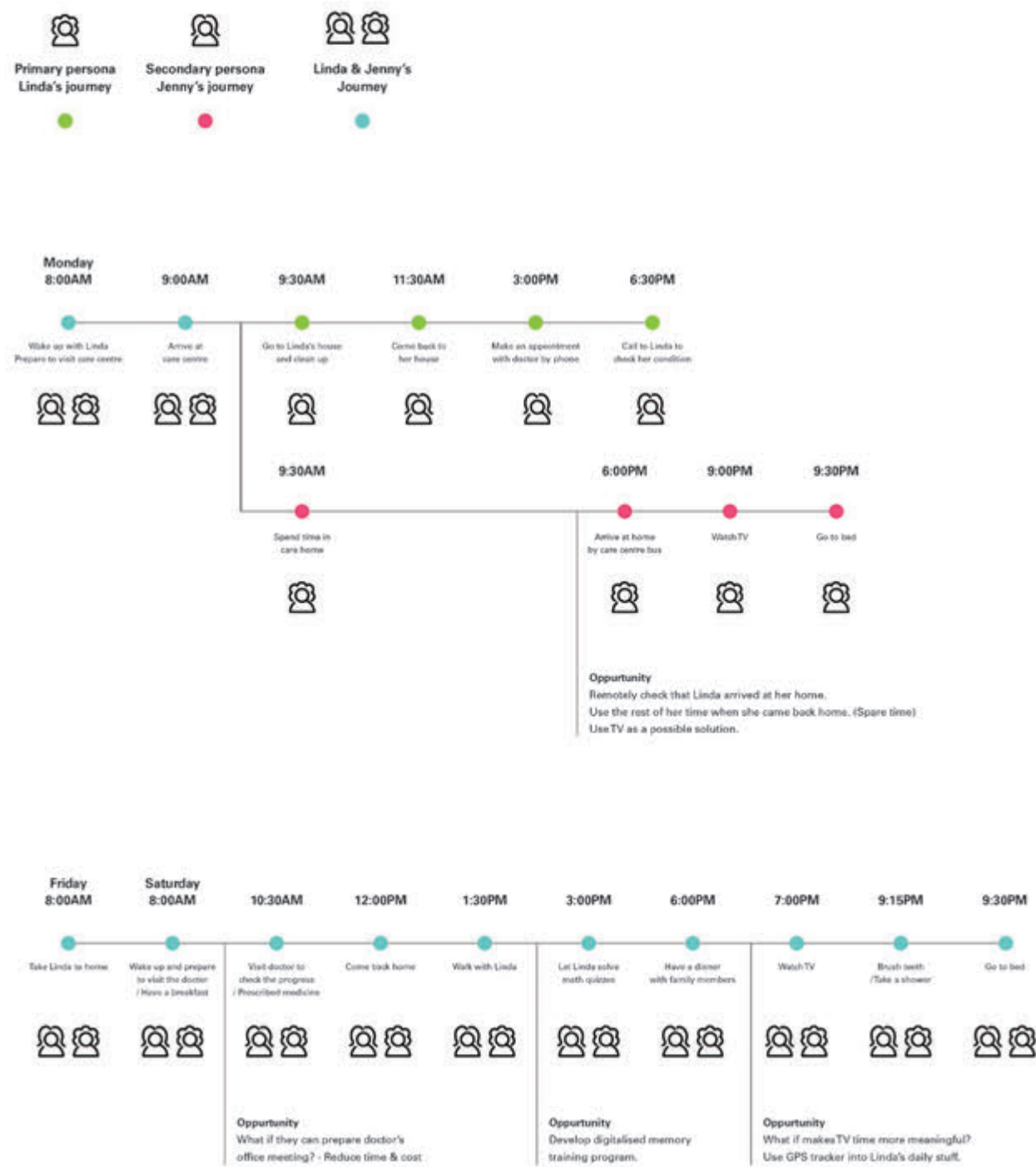
Jenny / 54
Current job: House wife
Carer of her mother Live with her family

- Needs
Supporting material to divide caregiver’s work, Remote care
- Pain points
A high level of stress / Need personal time / Spend many time to take care of her mother, but she is busy because she works full time.
- Family (Other carers)
Mother-Dementia patient, Live separately. Husband-Business man, Not able to help her. One older brother-He is an office worker. Sometimes help her.
Two daughters-They support carer’s work some- times during the weekends.

User Story
She is the primary carer of her mother. She lives with her family but every weekend. She brings her mother to her home and has time together. Other family members don’t have enough time to care Linda so that caring is almost her own work and this is the main reason for her high level of stress. However, she always worries about her, so they have a call every day to check Linda’s condi- tion. For Linda’s memory active, she let her moth- er solve simple math quiz. But she always has to check answers. She is having a hard time because her mother asks the same questions again and again and starts to forget essen- tial things such as reading time, feeling the weather.

3.2 -User Journey Map

Organising users' daily activities with several touch points helped to find opportunities in the users' lives and possible solutions that could be applied to certain touch points. Here are personas Linda and Jenny's weekday and weekend journeys.



3.3-Insights

- 1. Applicable points**
What if use patient's free time to remote care?
- 2. Smart TV as a possible solution**
What if use smart TV as a delivery method?
- 3. Digitalised**
What if digitalised dementia brain training activities?
- 4. Reduce cost**
What if develop personal cognitive assessment to reduce cost of visit doctor?
- 5. Inclusive**
Design service for both patient and caregiver

4-Develop

Develop and iterate ideas that can be prototyped.

- 1-Desk Research
- 2-Co-creation
- 3-Case Study
- 4-Prototyping
- 5-Testing
- 6-Insights

4.1-Desk Research

As a possible solution, smart TVs could be used for dementia care. At this stage, this possible solution has been proved through desk research.

4.1.1-TV Is an Important Component of Seniors' Independent Life

The article 'TV for Seniors' highlighted some advantages of age-in-place without making any changes: 1. Is less expensive 2. Maintains freedom and dignity. 3. Enables them to remain in contact with friends, neighbours, and family members. As a result, they can improve their quality of life. (Independa, Inc., 2015)

Also, active participation in media consumption is an important part of the lives of the elderly. Recent studies showed that music, films, and TV are key components to their well-being, (Chotiner, 2016) and most of the senior citizens rely on television for entertainment, accessing the weather, staying on top of the news, and being alerted of any emergencies. (Waxman, 2017)



My grandmother is watching TV and it's her favourite time.

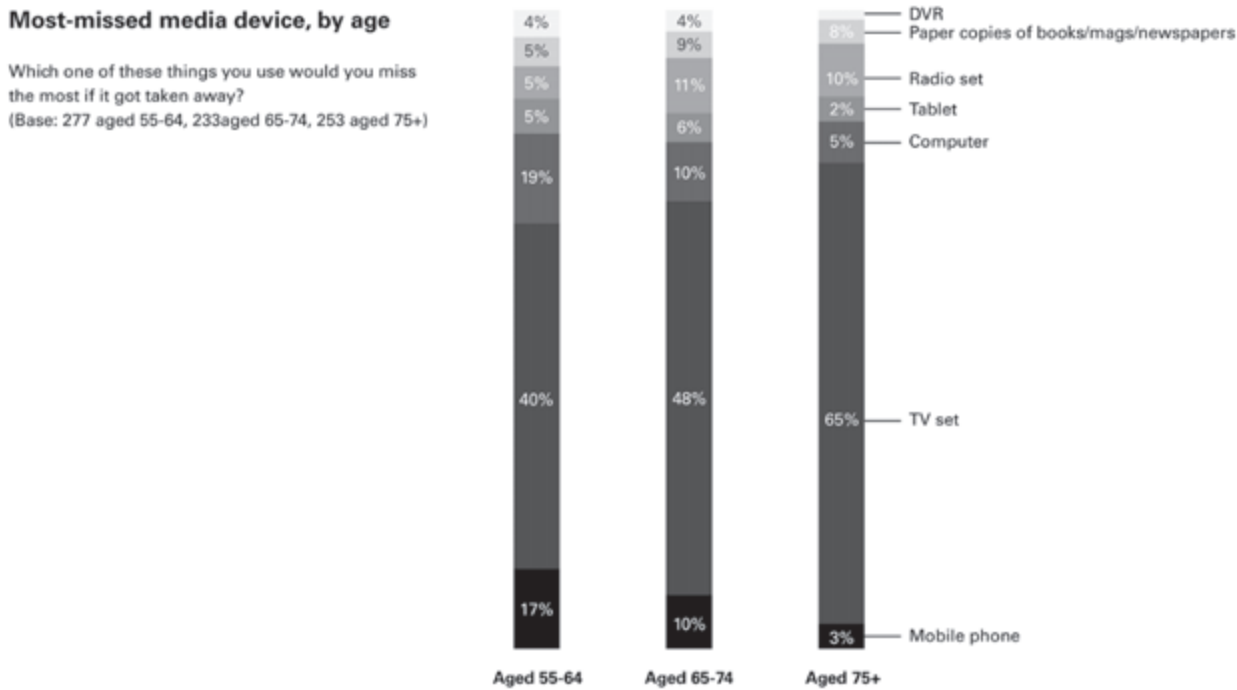
"TV is an important window to the world and a basis for shared experience for seniors... We found that the primary gratifications the aging audience sought from media, including TV, were a sense of being more involved in the world, entertainment, acquiring information and passing time."
-Kathaleen Reid

4.1.2 -The Digital Generation
Is Not Just Kids Anymore

Slowly, but surely, digital consumers are taking over the coveted media demographics. This means that opportunities for adults (65+) are shifting to the digital generation. Which digital product is the most familiar among senior citizens? In the report, 'Adults' media use and attitudes,' by Ofcom, it asked elderly people to say, out of all the devices they use, which device would they miss the most if it were taken away? (Ofcom.org.uk, 2016)

“Mobile phones are the most-missed media device among all adults, particularly younger adults, but TV is still most missed among the over-55s.” (Ofcom.org.uk, 2016)

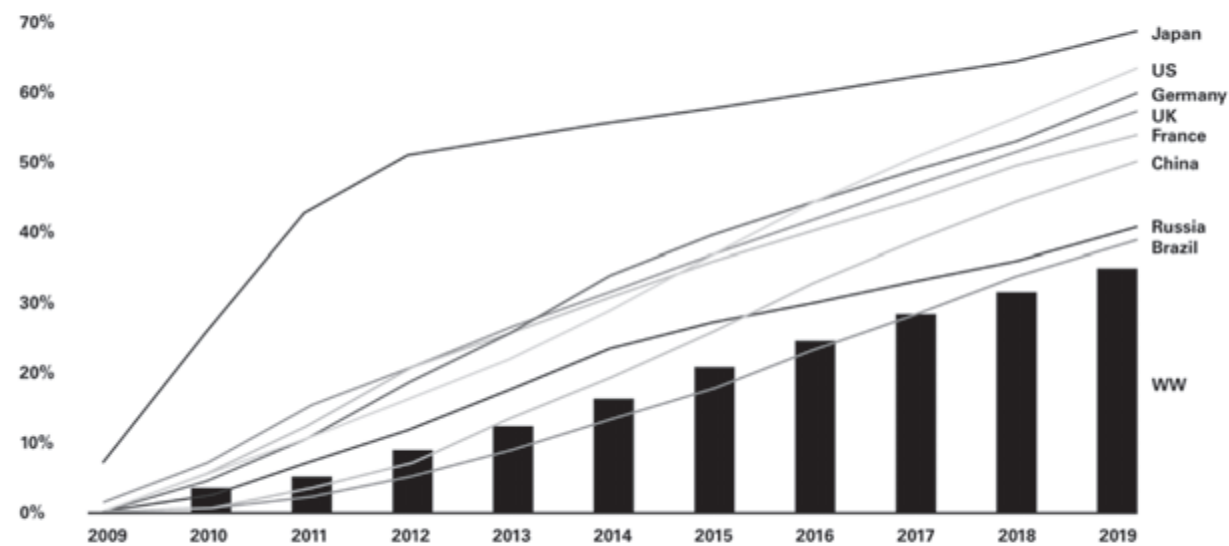
Currently, people who are 65+ years of age profoundly loved TV sets compared to other media devices. Then, how about Smart TVs? Based on the research, by 2019, more than 50% of TV households in Japan, the U.S., the UK, France, and Germany will have Smart TVs, according to IHS. (Correspondent, 2016)



https://www.ofcom.org.uk/__data/assets/pdf_file/0026/80828/2016-adults-media-use-and-attitudes.pdf

Also, the age group of Smart TV owners' percentages is quite similar, and they take advantage of the internet capability of their TVs. In a nutshell, the penetration of Smart TV is increasing, and adults can use its features very well.

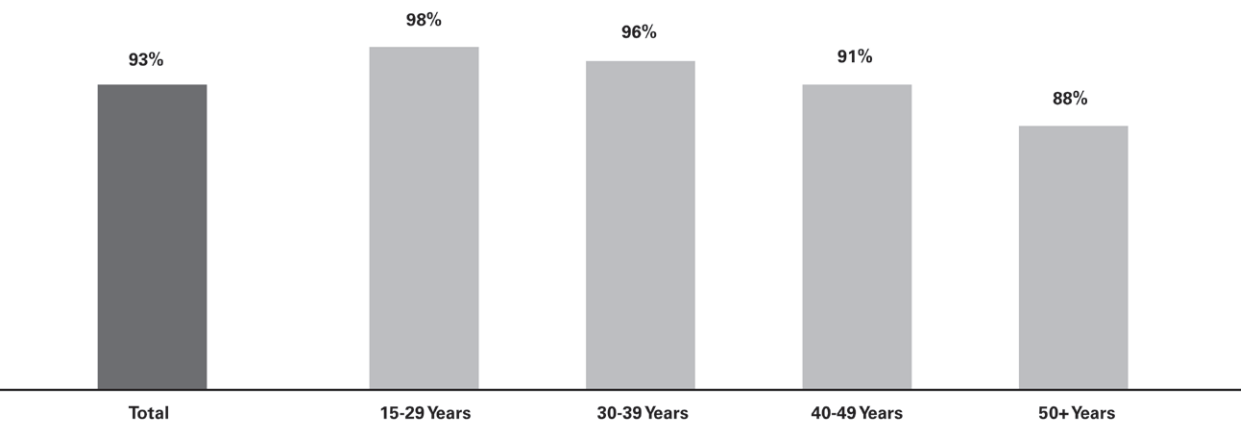
Smart TV Household Penetration by Country



<https://www.broadbandtvnews.com/2016/02/02/strong-smart-tv-growth-in-japan-us-and-europe/>

High internet connection rate across all age groups

93% of SmartTV owners are actually using their SmartTV features.
Also, all age groups take advantage of the internet connection of their TV.
(UK data; Base: SmartTV owners)



http://www.smartclip.com/sites/default/files/content/case-studies/case-study-pdf/smartclip_Smart%20TV%20Insights%202015_UK.pdf

4.1.3-Smart TV as a Delivery Method

When we think about our common living room, the TV is always at its centre. The TV is a simple-to-use device and is a favourite among older adults; they do not need to be trained to use it. (Seniortv-aal.eu, n.d.)

The strengths of using the Smart TV for home care are as follows:

- 1. It is easy to connect the Smart TV with other digital devices such as smart-phones and tablets, as well as with other secondary peripherals like Play-Station, Wii and Kinect for certain services.
- 2. It can act as an easy way of keeping in touch with their friends, family, caregivers and other people around them (for non-smartphone users).
- 3. Caregivers or family members can remotely control the Smart TV.
- 4. Users do not need to buy a new product; they can install the system in the original TV.

4.2-Co-Creation

Co-creation was conducted with users as advisers to create a value-rich experience to organise the contents of the brain training Smart TV application. The involvement of direct users and other external stakeholders allows for the creation of differentiated contents and unique and personalised customer experiences.

4.2.1-In-depth interview
: Involvement of caregiver

Interviewee
Caregiver (Age. 53) who is caring an early onset dementia patient.

Purpose
Gather ideas as many as possible and categorised based on their aims.

Main question
What kind of contents could be suitable and useful for you and your loved one?



Insights

Mainly, the contents aim to recall memories from daily life. Also, her advice divided into two categories which are from cognitive assessment and entertaining activities that other patients and caregivers are doing currently.

1. Contents from Cognitive Assessment

The former one is based on cognitive assessment paper which is normally conducted in the doctor's office. This assessment paper asks about reading time, calculation, simple thing and name of animals. Also, apart from the assessment, she hopes her loved one to handle the sense of weather and remember their family and herself.

2. Entertaining Activity

Reading news and simple exercise are recommended as an entertaining activity for brain training and patient's health.

*"Repetitive learning about supportive information on daily living could be helpful to keep the patient's independence."
-Dementia caregiver (53)*

4.2.2 -Co-Design Activity : Involvement of caregiver

What do you want your loved one to keep remembering?

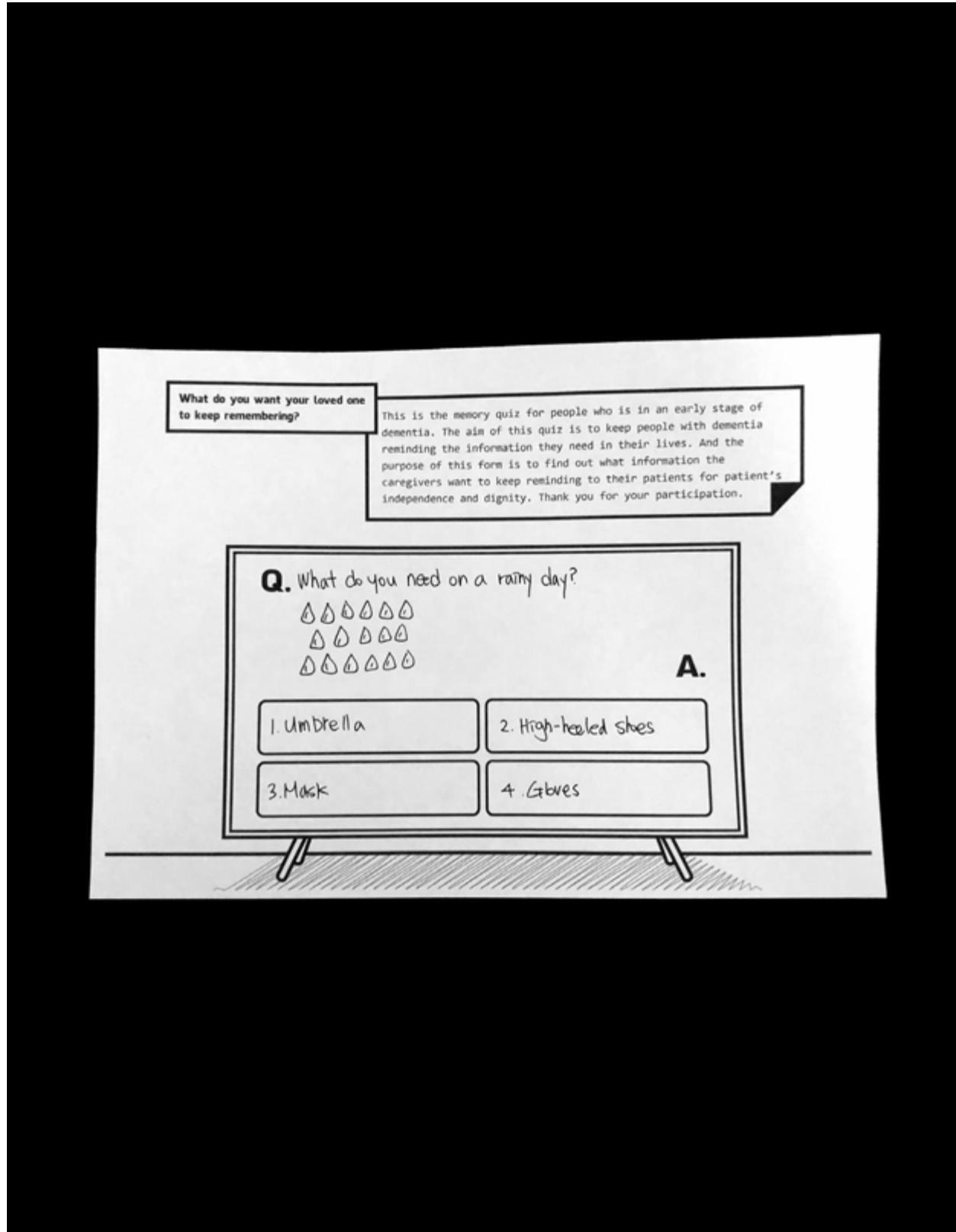
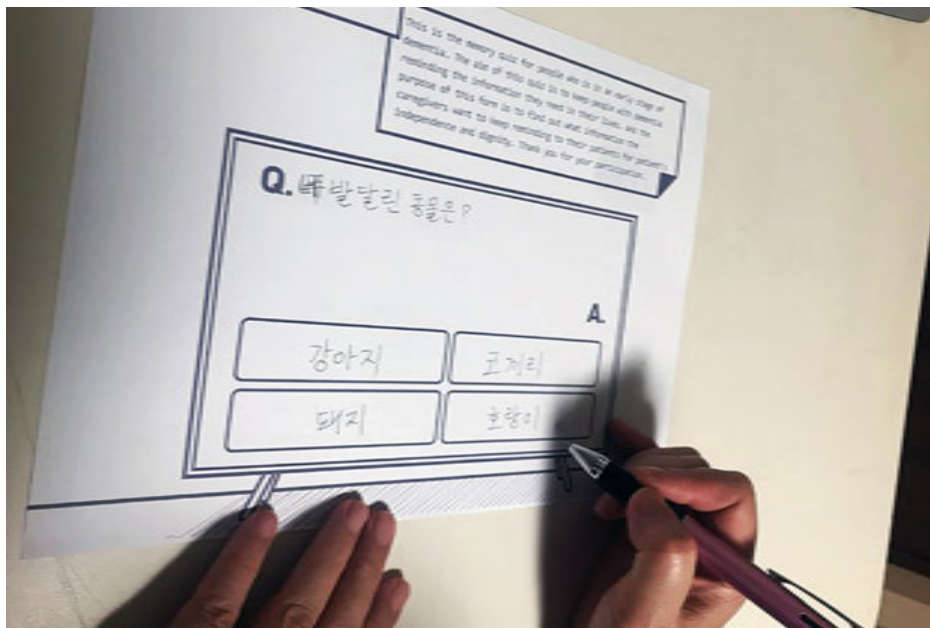
This is the memory quiz for people who is in an early stage of dementia. The aim of this quiz is to keep people with dementia reminding the information they need in their lives. And the purpose of this form is to find out what information the caregivers want to keep reminding to their patients for patient's independence and dignity. Thank you for your participation.

Q.

A.

For further ideation, co-design activity was conducted with caregivers. This sheet provided closed to final output and let participators create question by themselves. This activity allowed narrow down their idea based on their experience into actual form clearly.

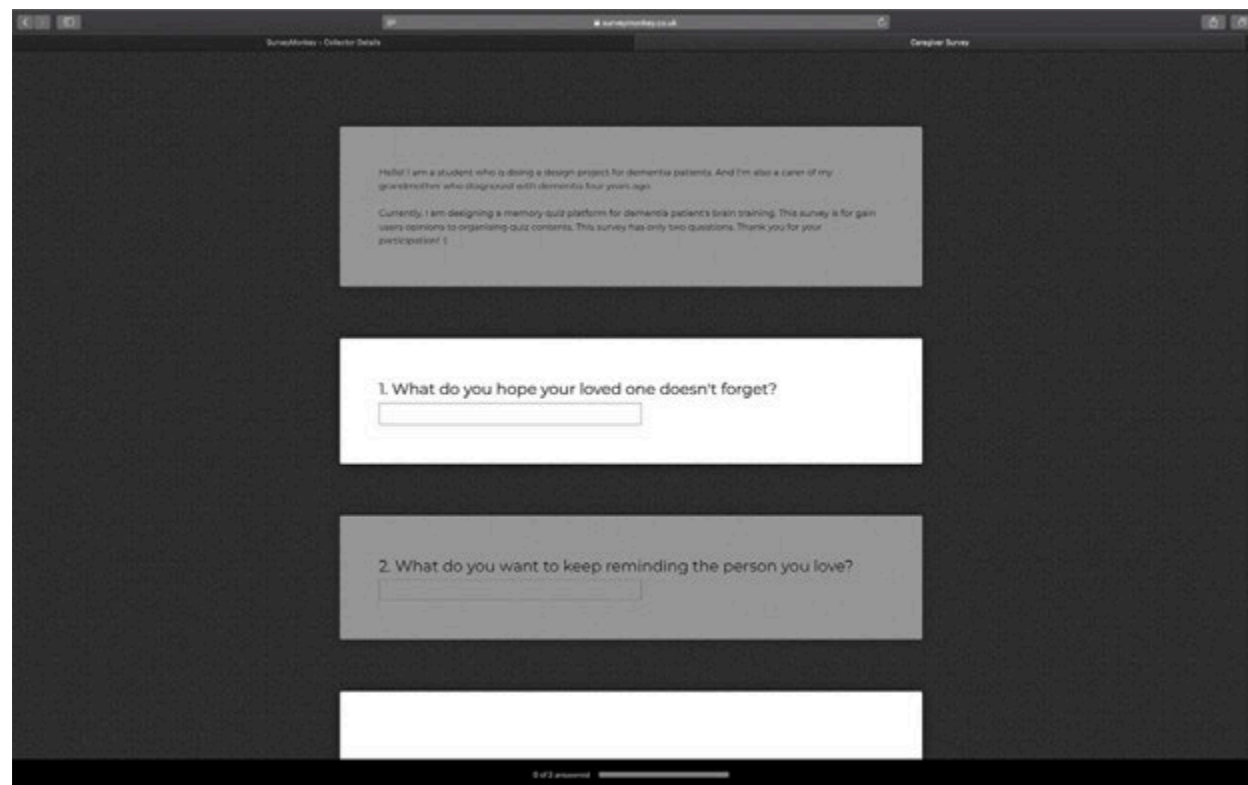
Co-design activity with family members



Co-design activity with family members

4.2.3-Online survey : Involvement of community

To gather ideas apart from previous activities this online survey aimed gain insights about caregiver's emotional opinion about what do they hope their loved one does not forget and what do they want to keep reminding to the dementia patient.

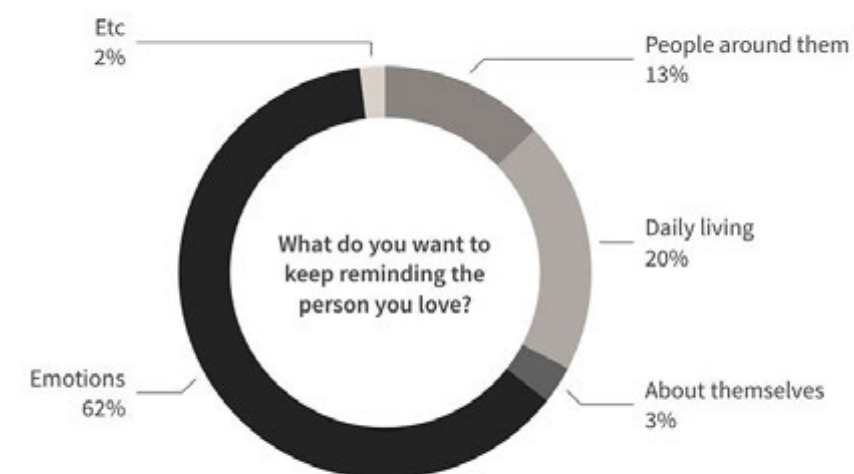
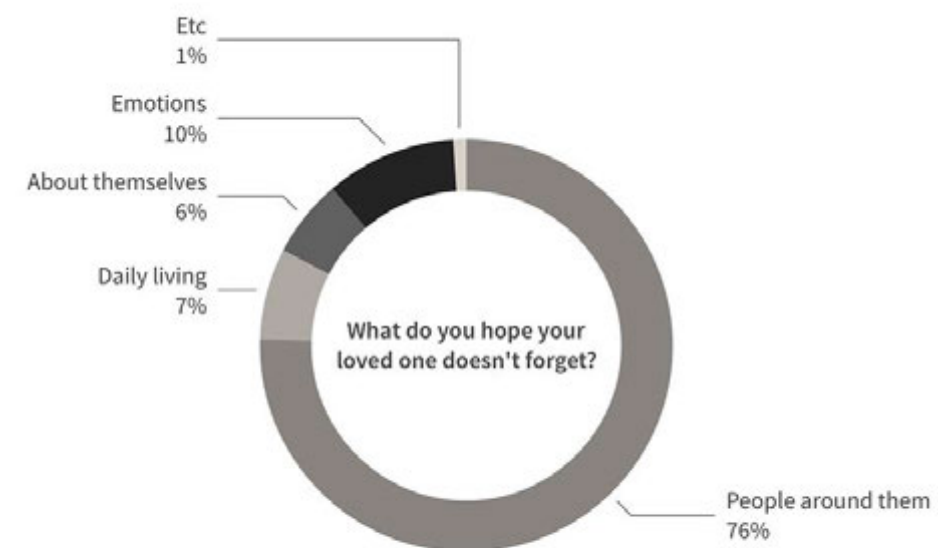


Online survey Screenshot 10/27/2018–11/2/2018

"I know they have very little ability to remember new information and this won't get."
-One response from the survey

As a result, caregivers hope their loved one does not forget the people around them, for instance, their family members. Also, they hope they do not forget how to manage everyday tasks such as how to eat, hospital appointment, home address, the layout of the bathroom and don't go outside in the dark. Also, they wanted to keep reminding about the emotions to them. Likewise, all family member love them always and remind about happy memories.

"I hope she doesn't forget that she has a family who loves her very much."
-One response from the survey



4.2.4-Desk Research : Involvement of doctor

Based on the different type of Cognitive Assessment Toolkit, the contents were divided into four categories. These categories were reflected to organise smart TV quiz application’s main contents.

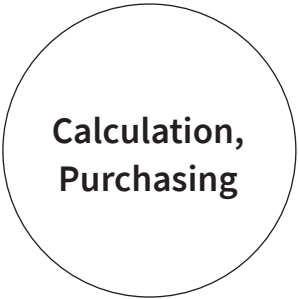
1. Time

- Date of birth? / Time? (to nearest hour)
- Last year of second world war?
- What year is it? / What month is it?
- Say the months of the year in reverse
- Clock drawing



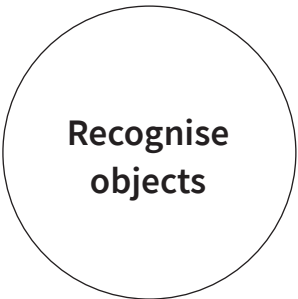
2. Math

- Count backwards 20 to 1
- Could you take 7 away from 100?
- Serial 7 subtraction starting at 100



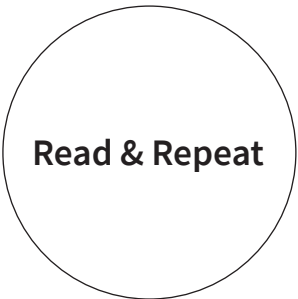
3. Things

- Now can you name as many animals as possible. It can begin with any letter.
- Ask the subject to copy this diagram
- Ask the subject to count the dots without pointing to them



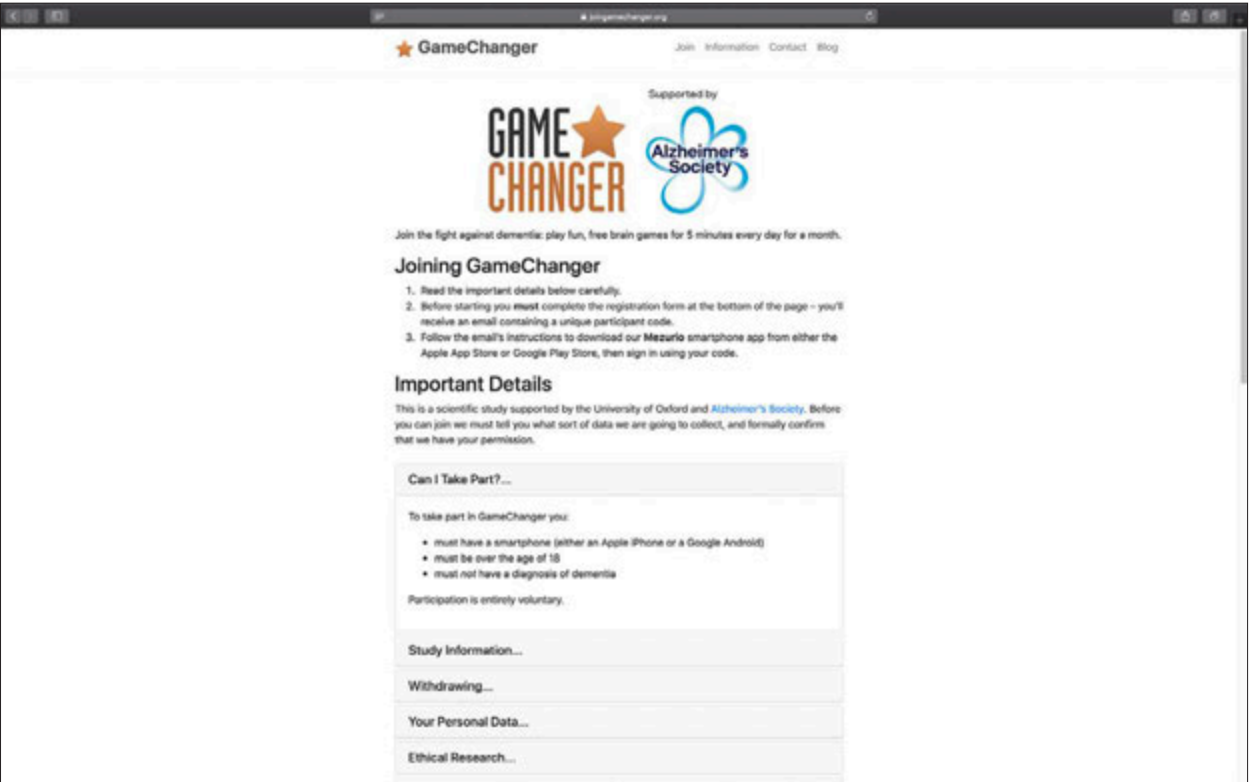
4. Memory Recall

- Read the script / Repeat the script
- Name of the current Prime Minister
 - Name of the USA president
 - Name of the USA president who was assassinated in the 1960s



https://www.alzheimers.org.uk/sites/default/files/migrate/downloads/alzheimers_society_cognitive_assessment_toolkit.pdf

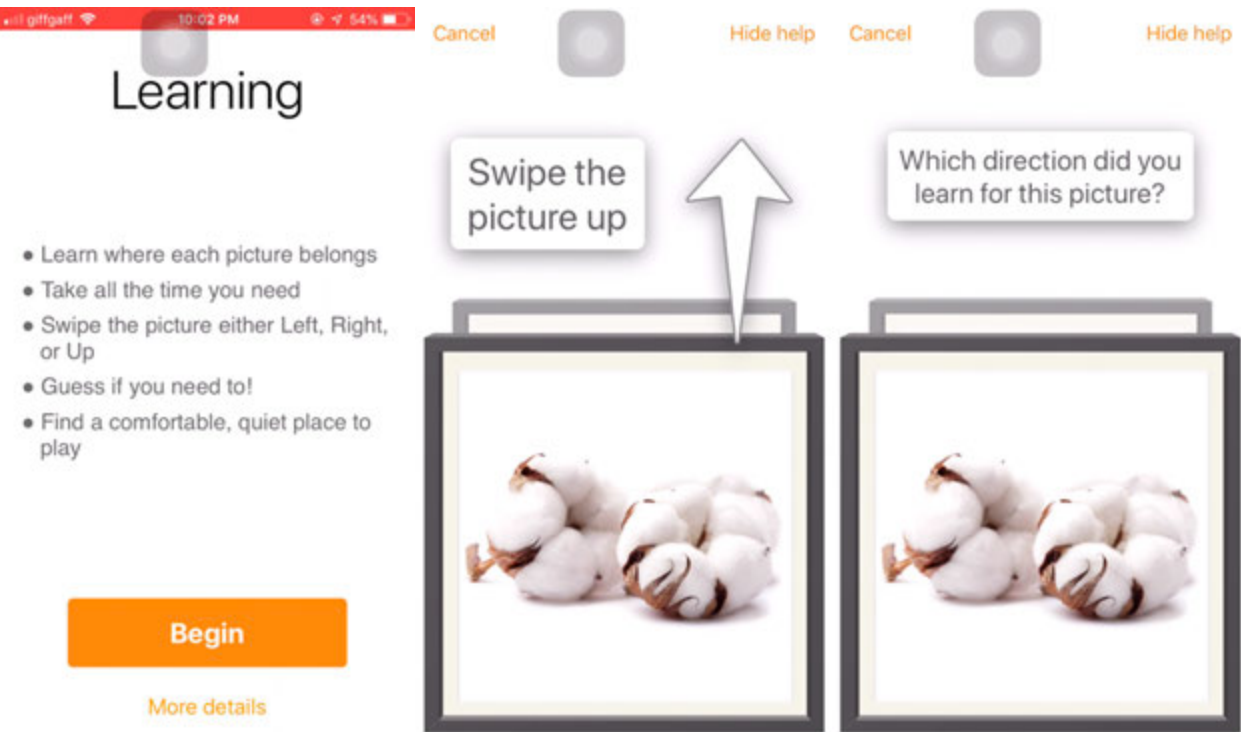
4.3-Case Study : Digitalised brain-training program



GameChanger

Game Changer is a UK-based scientific study supported by the University of Oxford and Alzheimer’s Society. This is a smartphone application for people who have not been diagnosed with dementia and anyone over the age of 18. The aim of this study is to understand the very earliest stages of Alzheimer’s disease and find a way to prevent, slow down, and treat the condition. Based on the research data, future research aims to figure out the baseline for detecting an individual’s risk of developing dementia and check cognitive changes. (Joingamechanger.org, 2018)

The content of this app is about short-term memory. It asks users to remember photos and directions and repeat the routine. After the first stage, the number of photos increases, and the directions become more diverse as the game progresses.



GameChanger app screenshots

How is it different from the present projects?

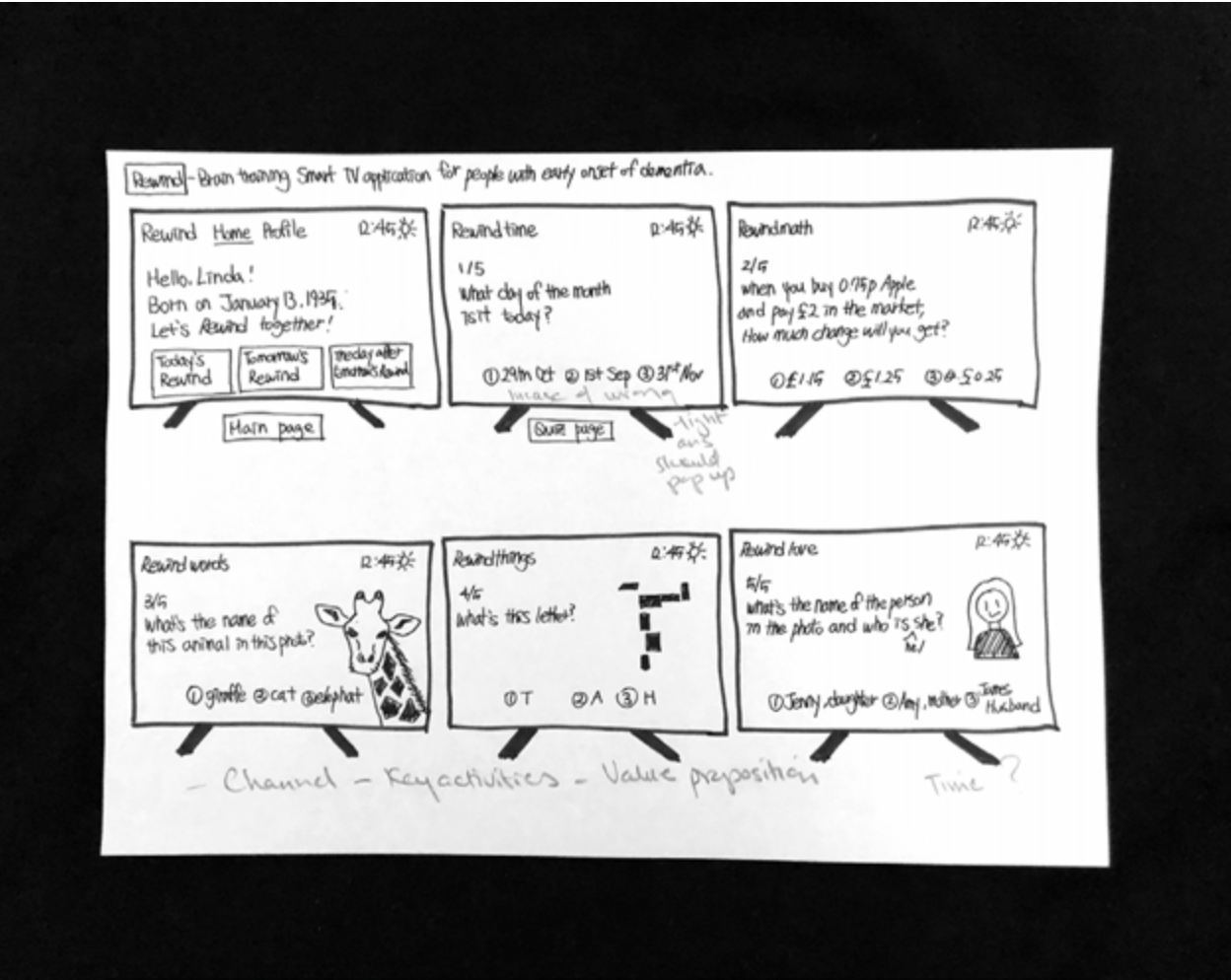
This study provides a program that aims to train short-term memory. However, the contents of the program do not present other values. Organised meaningful information that could support the patient’s daily life and everyday tasks could be what makes this study different.

Insights

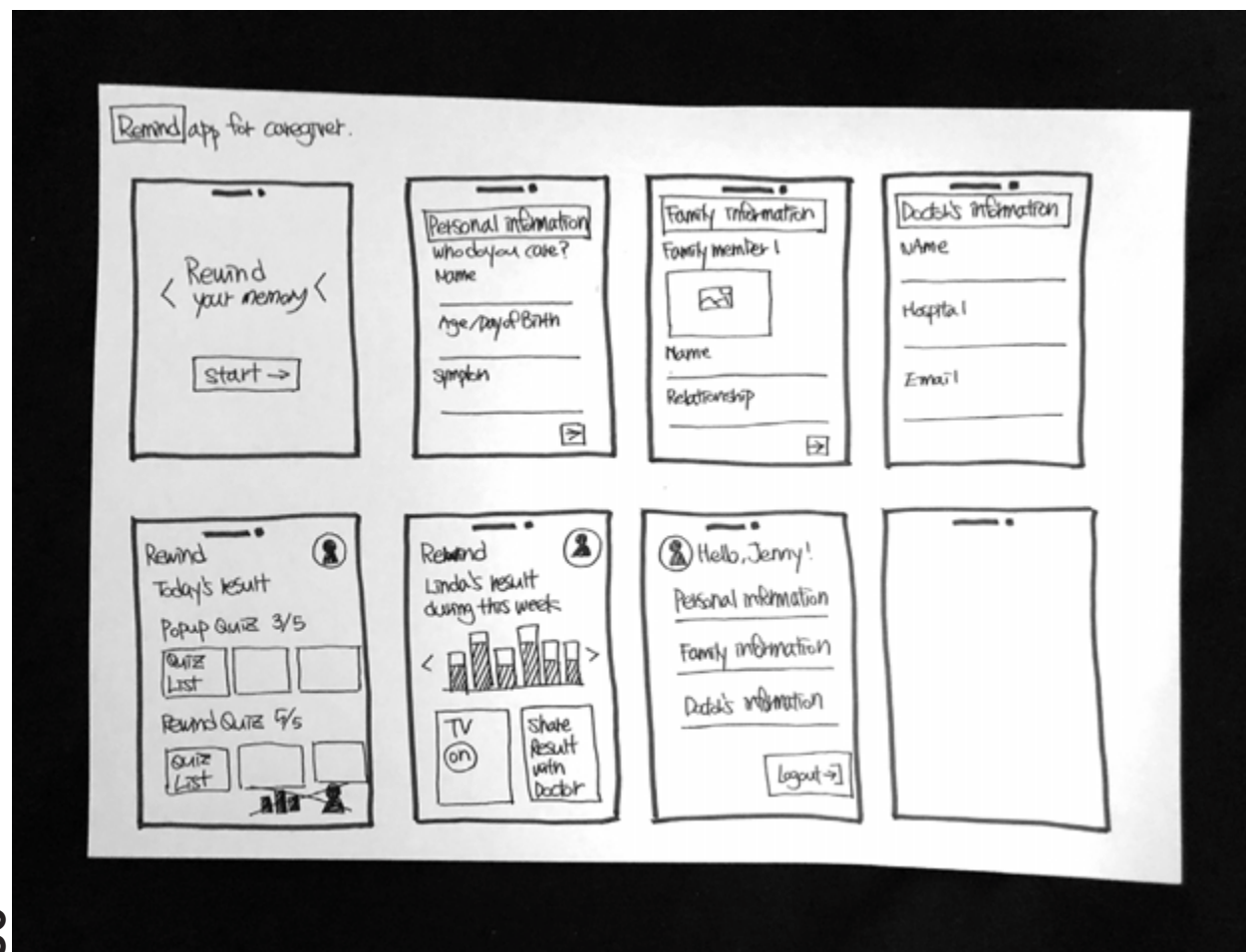
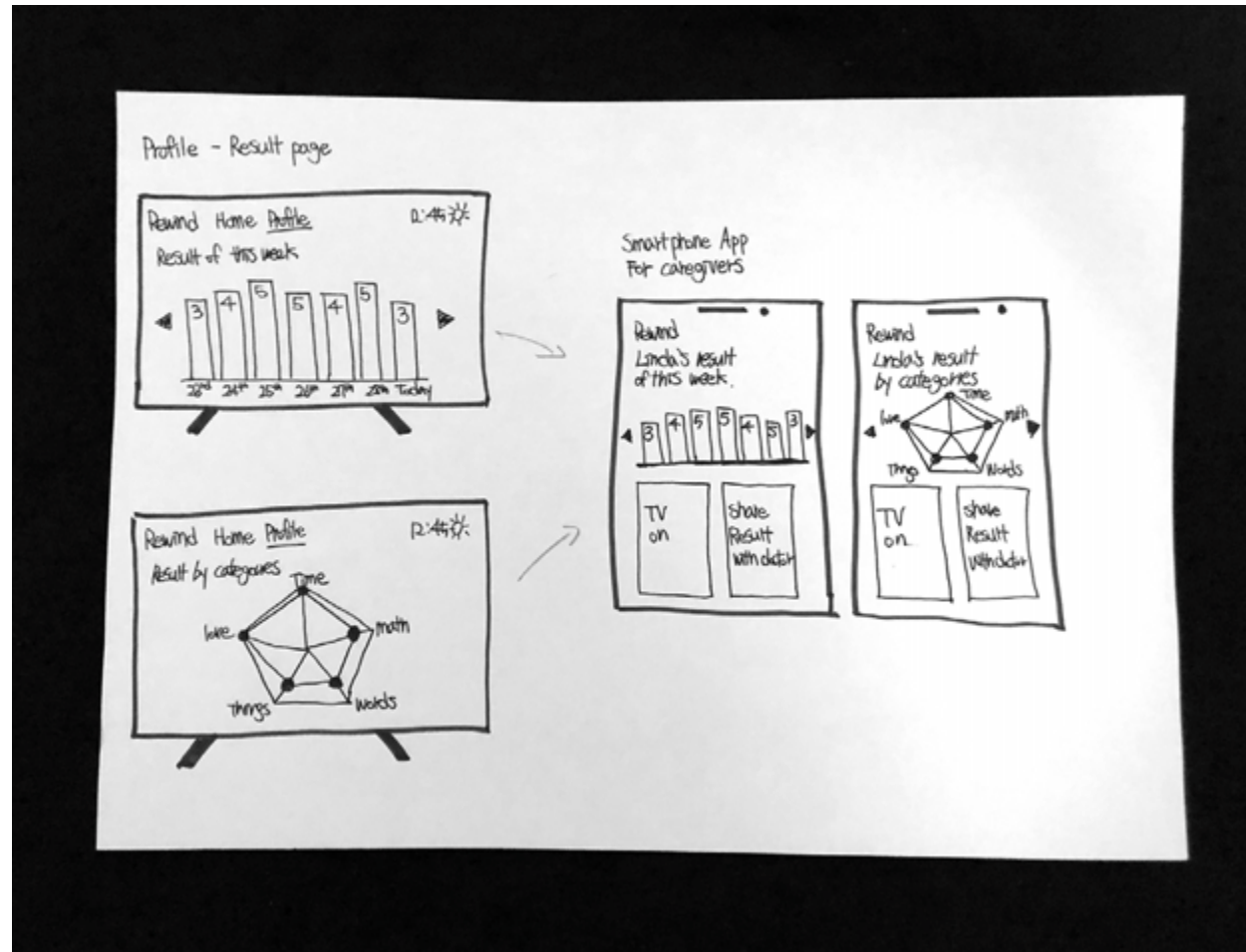
This brain-training program is organised by the University of Oxford and supported by Alzheimer’s Society. It provides a well-designed program, and the results are used as research data. It creates another value from connection with Alzheimer’s Society. This could be applied to my project as well.

4.4-Prototyping

The flow of the screens was sketched out to narrow down ideas into the paper sketch. This session allowed first inspiration of the layout of each screen and the flow of the functions. Paper prototyping screens lead to organised the main structure of the interfaces.



Paper prototype



4.5-Testing

To gain feedback from experts, the testing session with paper prototypes helped to gather valuable insights and allowed more user-centred design.



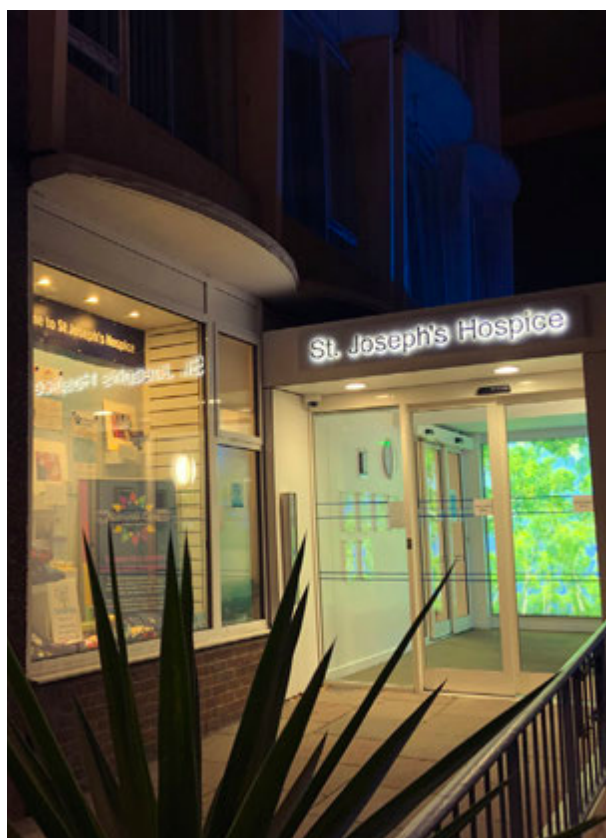
'Dementia Friends' is the programme supported by Alzheimer's Society for change people's thoughts of dementia. The purpose of the programme is change the way of public's thoughts, actions about dementia. As a student who is doing project for dementia patient's well being, I became a part of the programme.



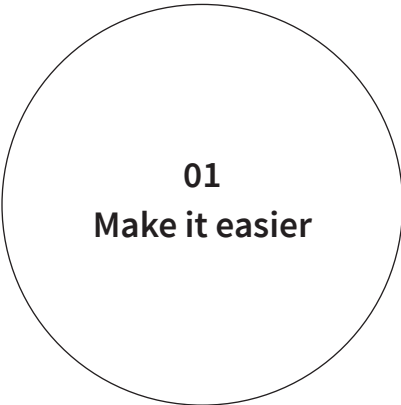
Participated in the Dementia friends information session allowed to meet dementia expert. Jack who is the organiser of the Dementia Friends information session at St Joseph's Hospital gave valuable feedbacks from his experience.



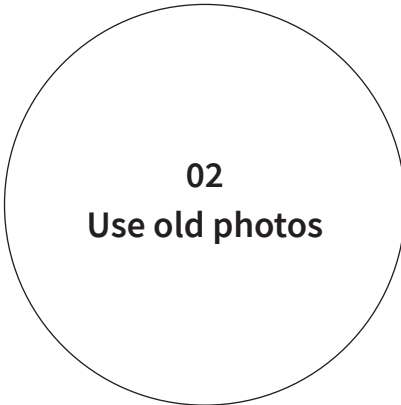
St Joseph's Hospital



Feedback session with Jack Dementia friends information session organiser



Designing questions easier makes them give confidence.



Dementia patients start to forget with recent memories. Using old photos can help patients to recall their old memories



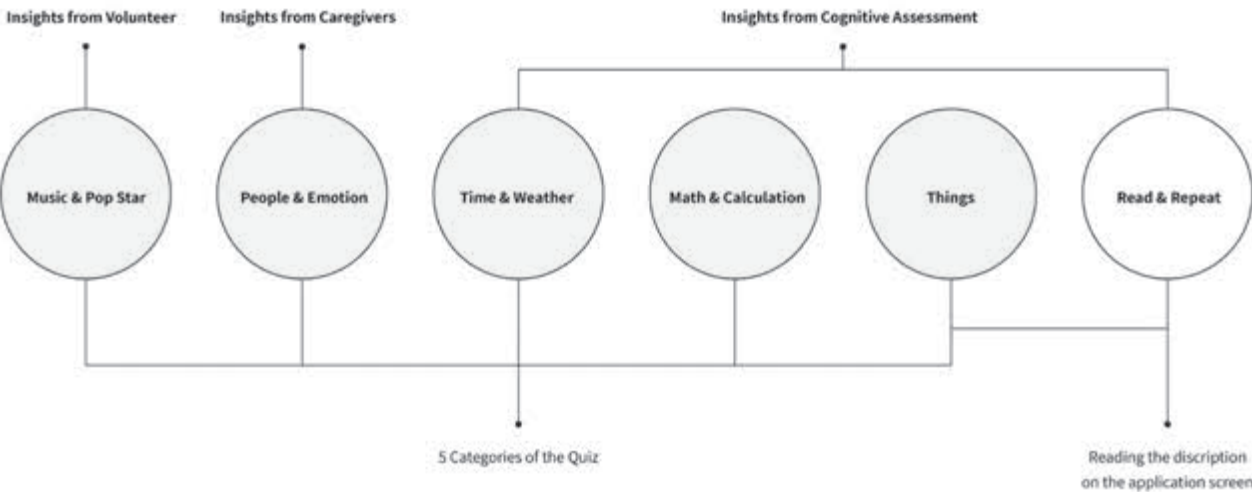
Use coin illustration in the math section. This will be helpful with the situation patients want to purchase products.



Music helps them to recall their old memories.

4.6-Insights

Organising quiz contents based on the Co-Design Session Insights



Final quiz contents were organised after the co-design session. They divided into five categories. The quiz will be organised along with the category and useful information to support user's daily living.

5-Deliver

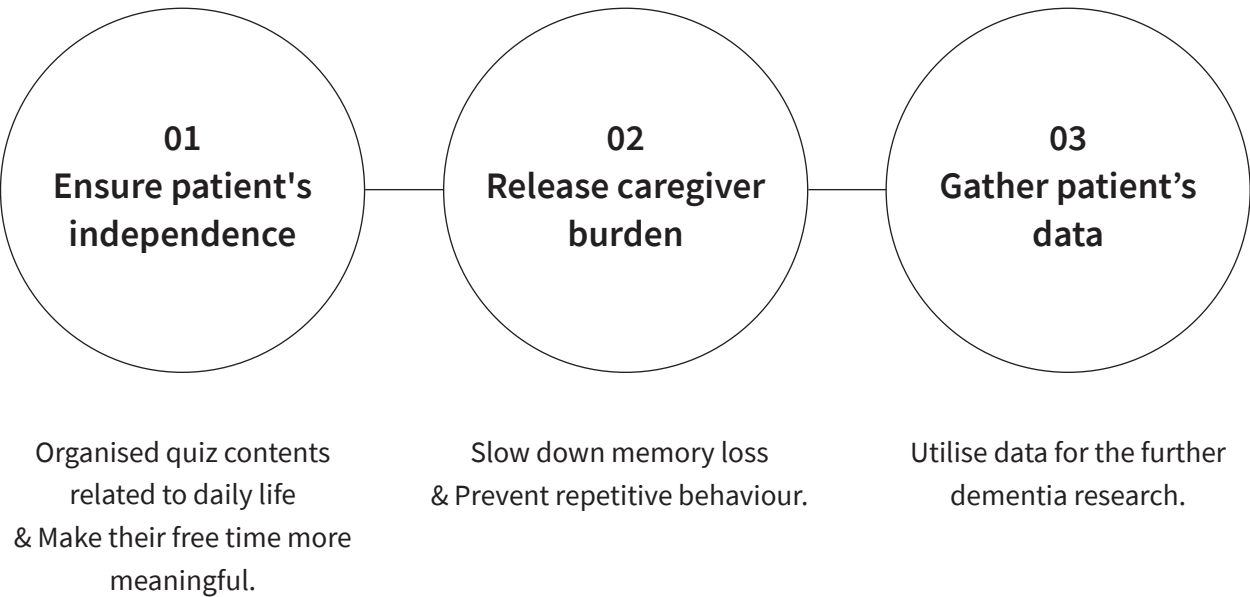
Implementation of ideas based on the previous research stages. Refine and design service delivery method.

- 1- Service Concept
- 2-Stakeholder Map
- 3-Value Proposition Canvas
- 4-Rewind System Map
- 5-Rewind Features Map
- 6-Service Elements
- 7-Rewind
- 8- About Data protection
- 9- Service blueprint
- 10 -Business model canvas
- 11-Impact

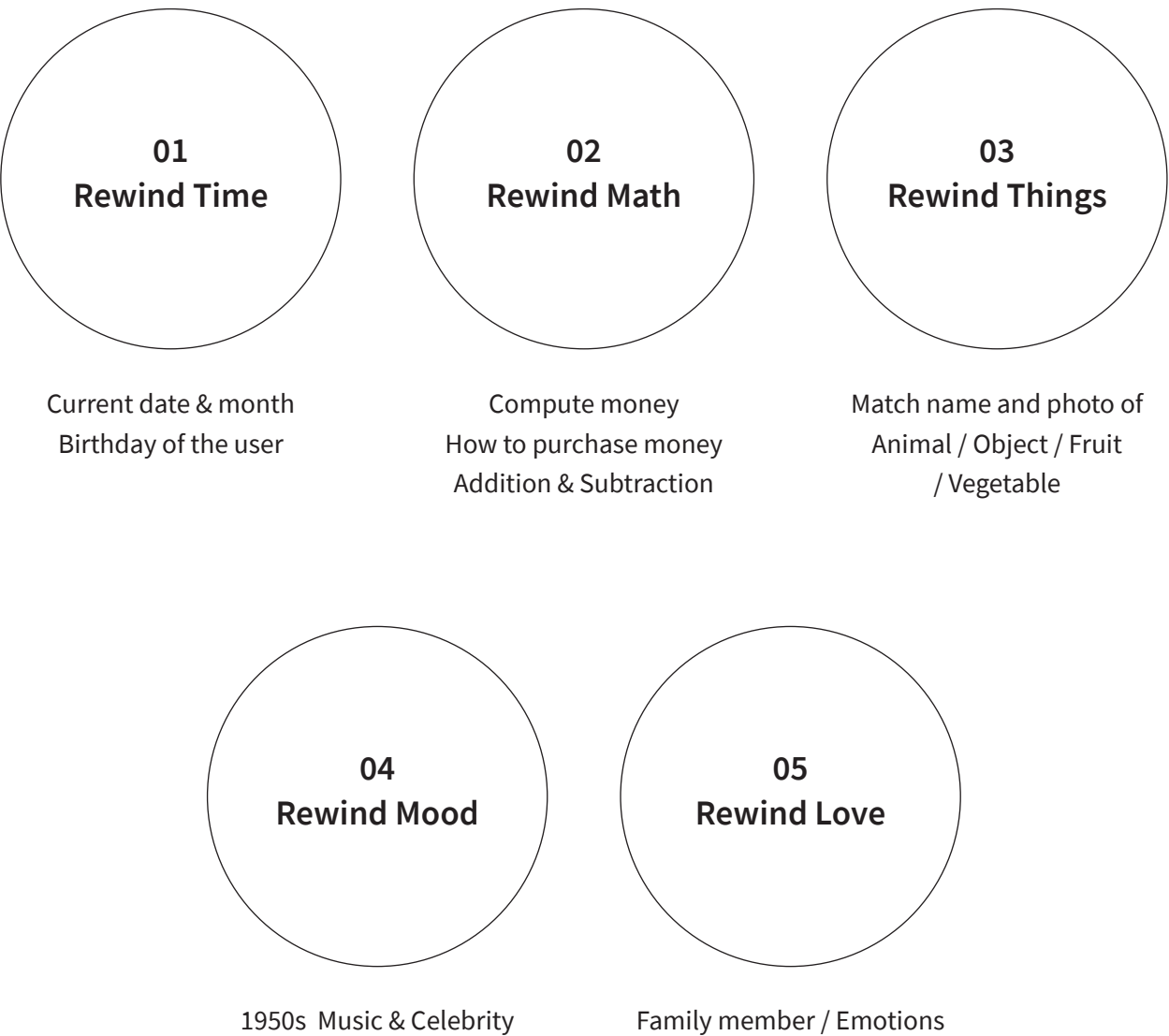
5.1- Service Concept

Rewind is a digital platform that provides brain training quizzes for dementia patients. Five quiz sets are provided in one day, divided into five categories: time, math, things, mood, and love. The result of the quiz is sent to the carer’s smartphone through an application, and this result can be shared with the doctor via email. Due to the advantage of TV, external services can be connected with this platform with the use of a GPS tracker and Wii.

Service key values

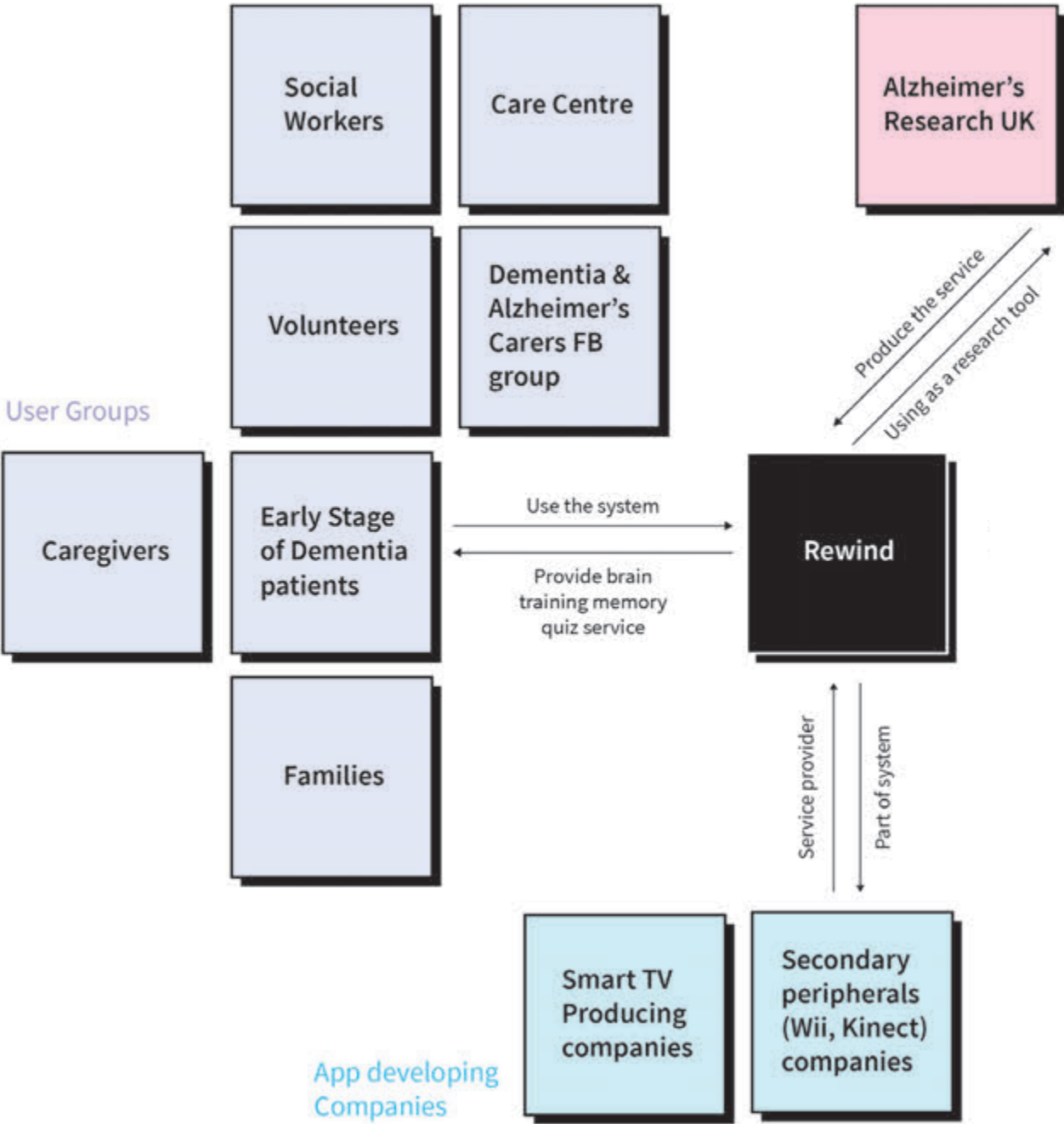


The five categories of Quiz

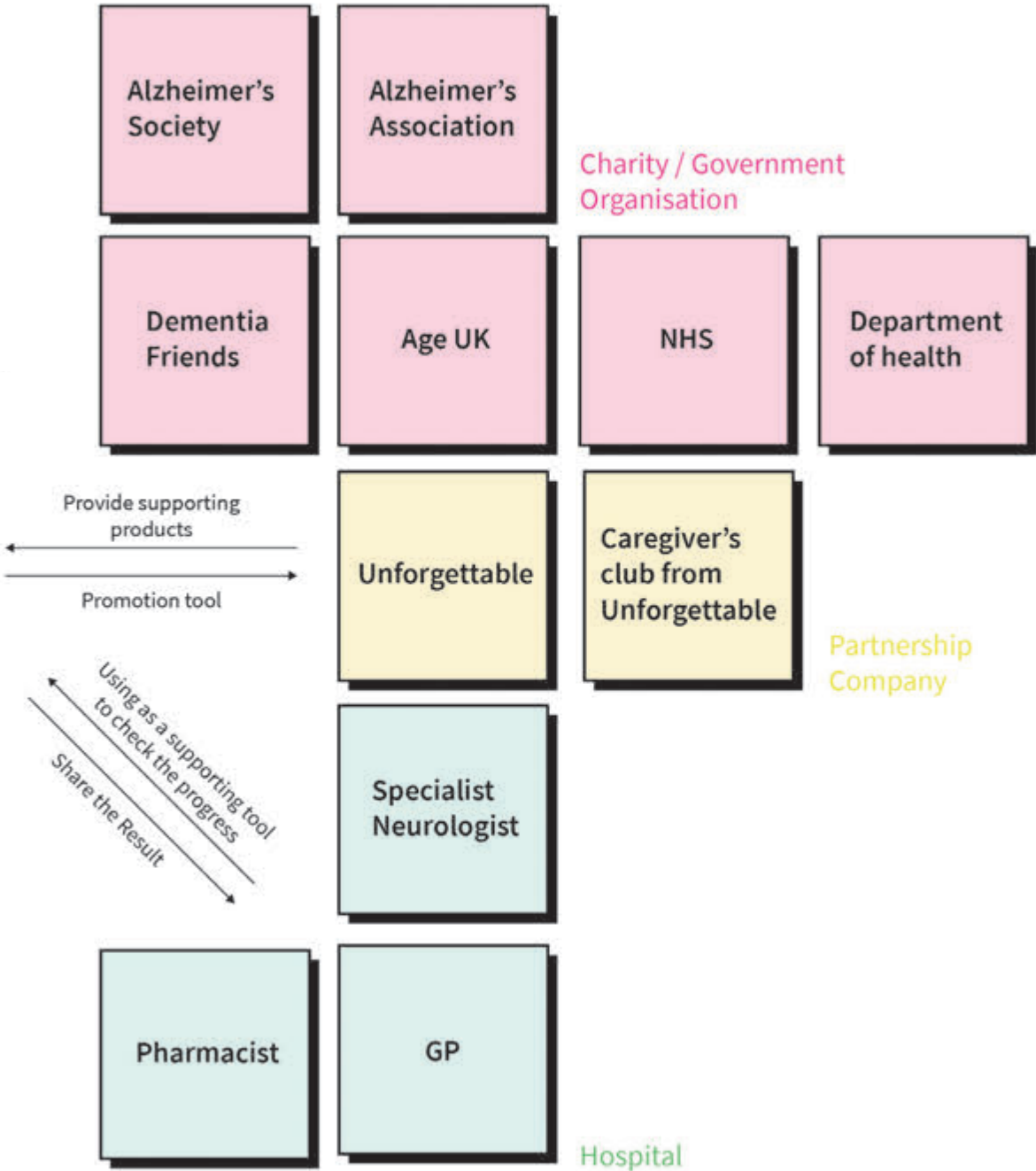




5.2-Stakeholder Map

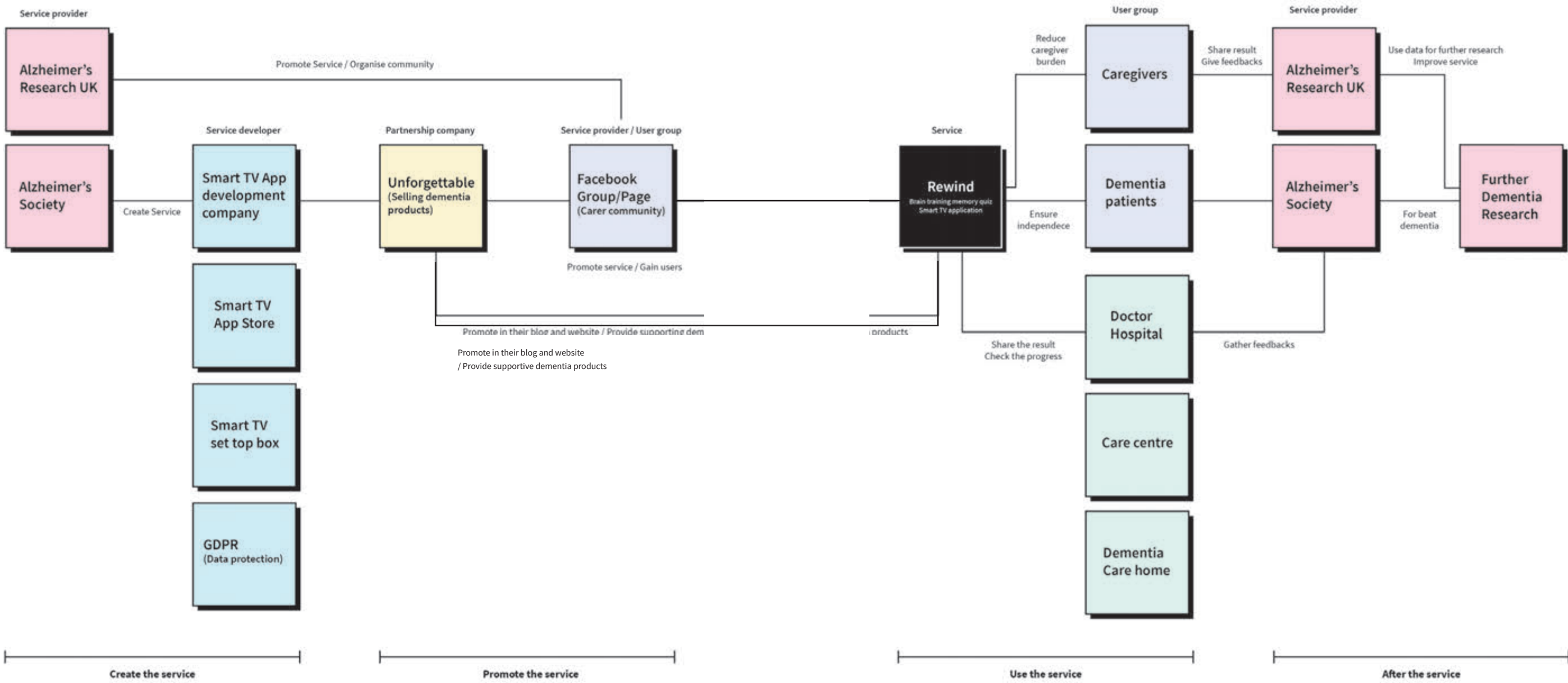


Stakeholder map is the map which is visualised all groups of cooperators related to the particular service. This method allows users, companies, partner organisations & charities, and other stakeholders to be shown and the relationships between different groups to be schematically analysed.



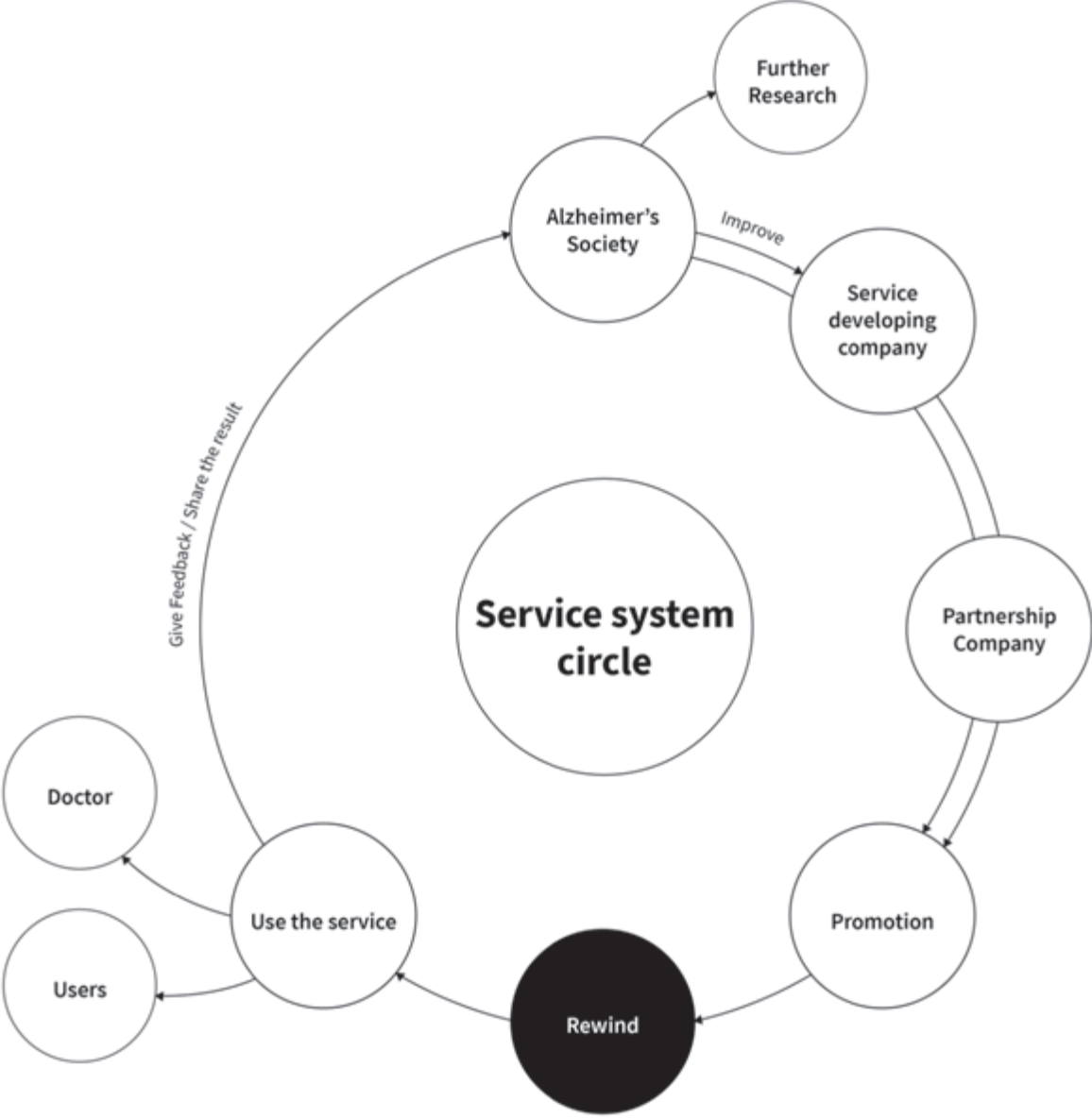
5.3-Value Proposition Canvas

To create more value, this service designed on the assumption that the Alzheimer’s Society provided the service. Due to Alzheimer’s Society’s participation, the service system could be circular and created more value.



5.4-Rewind System Map

Rewind has a circular system. Alzheimer’s Society provides the service and the data gathered to the Society again. Through the circular system, the service will be improved and provide the better user experience.

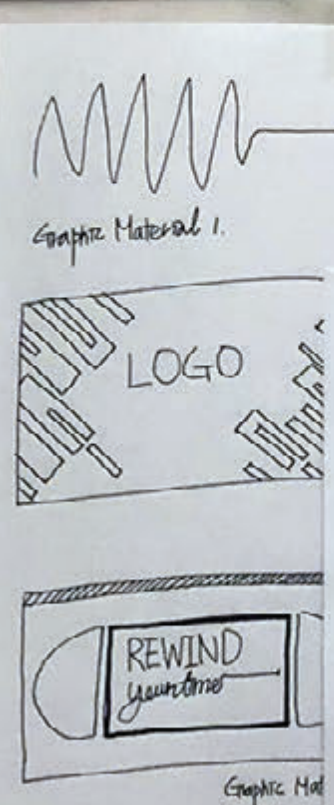
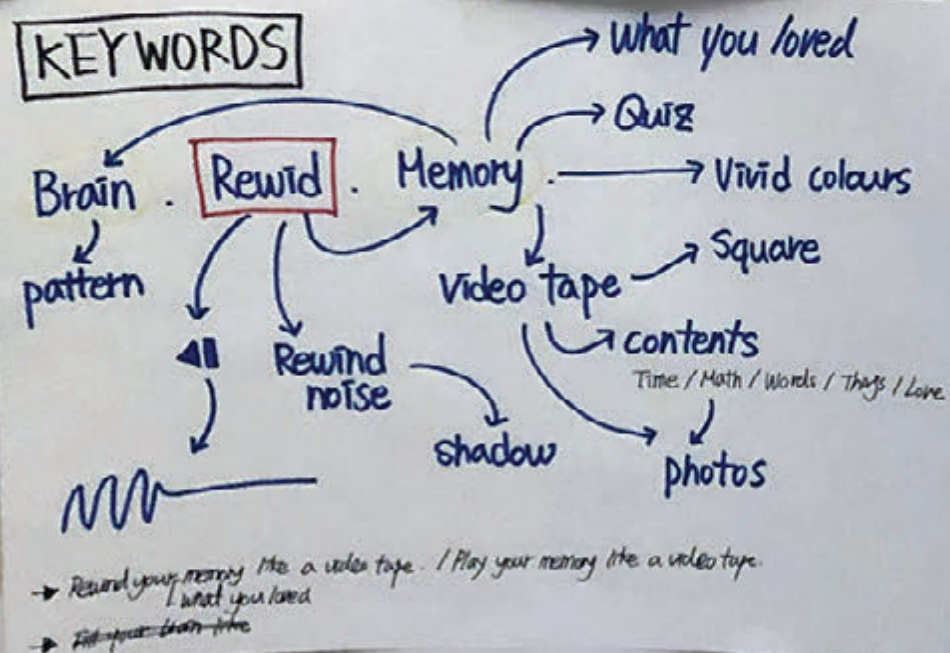


5.5-Rewind Features Map

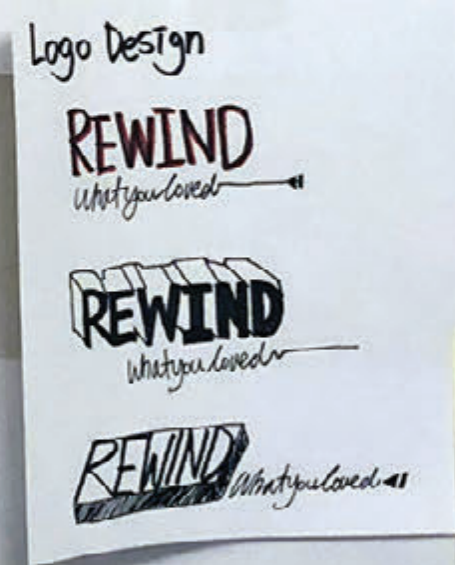
Rewind has key seven features. This chart below presents the contents of the feature and the purpose of the contents.



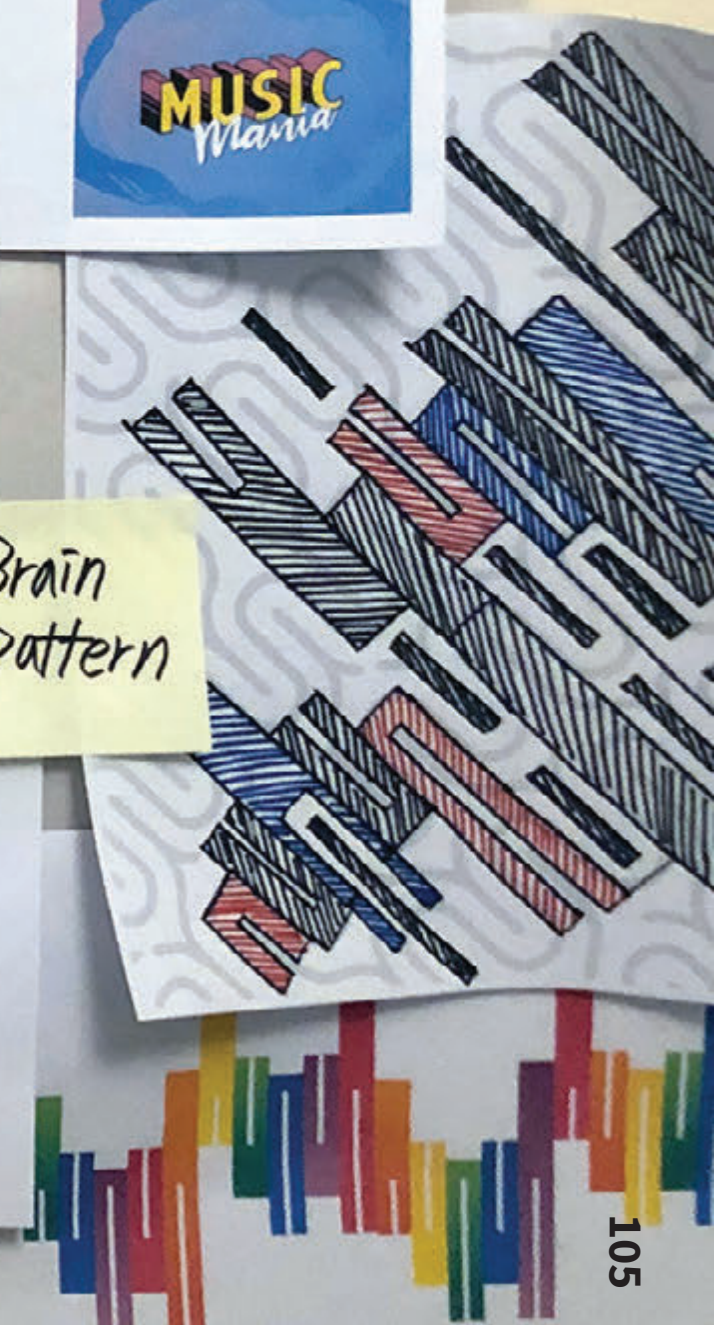
Shadow



Graphic
Material




Brain
pattern



Logo
Design

104

KWIND time
KWIND math
KWIND words
KWIND things
KWIND love
KWIND break quiz



REWIND

5.6-Graphic Design Guidelines

These sheets provide the guideline heuristics for designing accessible digital interfaces, services, and contents for people with dementia. Dementia and Alzheimer’s disease symptoms are diverse. Thus, it is important to consider different levels of digital literacy. This list can be used for evaluating digital interfaces. (Rik Williams, UX Architect, 2017) Rewind interface considered this accessibility. Therefore, Rewind can provide comfortable interfaces for the dementia patient’s digital experience.

Dementia Digital Design Guidelines		Check O / Not in my case Δ
0. Include people affected by dementia <i>Before your design was launched, did you include with people affected by dementia?</i>		
0.1 Include people living with dementia in the design stages. <i>Did you conduct primary research with representative users?</i>		O
0.2 Get feedback from people living with dementia during beta. <i>Did you test, validate and iterate designs with representative users?</i>		O
0.3 Communicate that your website is dementia-friendly. <i>Help build dementia-friendly communities and mitigate stigma.</i>		O
1. Content <i>Make it clear what your website is doing and why you're doing it.</i>		
1.1 Use Simple, Clear, Direct and Precise language. <i>Avoid generic calls to action, complex wordplay, jargon. Use very clear, specific and unambiguous, headings and labels. Struggle to remember terminology. Struggle to find correct word.</i>		O
1.2 Use Explicit and Arresting content. <i>Make the purpose clear and content interesting and focussed.</i>		O
1.3 Make content easily printable. <i>Useful for people with issues with vision and perception.</i>		O
1.4 Avoid using abbreviations and acronyms. <i>Don't assume people with dementia will recognise these.</i>		O
1.5 Include content from people living with dementia. <i>When relevant provide tangible context: - evidence living well with dementia. - include helpful stories from people living with dementia.</i>		O
1.6 During longer tasks, give clear feedback on goal & progress. <i>People living with dementia may have problems with attention AND memory.</i>		O
1.7 Use dementia friendly language <i>People with dementia prefer words and descriptions that are accurate, balanced and respectful.</i>		O
1.8 Content should be context and person sensitive		O
2. Layout, Navigation and Interface Design <i>Make your navigation explicit and signpost a route back to the homepage.</i>		
2.1 Avoid splitting tasks across multiple screens. <i>Especially if this relies on memory of previous actions. May struggle to remember location and task in a process.</i>		O

2.2 Use clear breadcrumb navigation. <i>So that it is easy to understand location in the site structure.</i> <i>Disorientation when trying recall relative location in a system.</i>	○
2.3 Use a clear "Home" button. <i>Do not rely on using a logo only to link to the homepage.</i> <i>Disorientation when trying recall relative location in a system.</i>	○
2.4 Make hyperlink styles and states clear. <i>Clear visual styles for :link, :visited, :focus and :hover link states.</i>	Δ
2.5 Use clear line and section breaks to make splits obvious. <i>Clearly defined sections with strong lines and explicit headers.</i>	○
2.6 Iterate designs gradually and judiciously. <i>Don't tinker with design necessarily. If it's working, keep it.</i> <i>Aspects of impaired memory and learnability.</i>	○
2.7 Avoid hiding navigation. <i>Hiding navigation harms discoverability and use for all users.</i>	Δ
2.8 Avoid using elaborate design and user interface patterns. <i>This may make the interface and content confusing.</i> <i>Users may not be able to learn new complex motor skills.</i> <i>Older people may struggle with complex movements, esp. if novel.</i>	○
2.9 Make links, buttons, controls have large enough target sizes. <i>Fine motor skills, and ability to learn M. skills, may be degraded.</i> <i>Also: general aspects of "Fat Finger Syndrome" and Fitt's law.</i>	○
3. Colours and Contrast Each type of dementia can damage the visual system in a number of different ways. Alzheimer's disease can often cause perceptual problems which mean people misinterpret some things they see. Aggregated dementia impairments mean that the world can become a disorienting and stressful place. In addition: as people get older normal vision will change simply due to ageing.	
3.1 Use a high contrast colour scheme to improve readability and confidence. WCAG ratios for contrast are 7:1 and 4.5:1 are a minimum . Support and enable by ensuring that what is important is highly visible . Help people with dementia navigate w/o needing memory, learning or reasoning. Older users will have reduced sensitivity to: - contrasts, - visual acuity, - perception unsaturated colours (pastels)	○
3.2 Use plain backgrounds for textual content Avoid background images, patterned background graphics. Damage to the occipital lobe can cause problems with perception. Plain backgrounds avoid distractions.	○
3.3 Avoid use of blue, especially for important interface elements. Colour vision declines with age, in particular, shades of blue.	○

4. Text and Fonts <i>The simplicity of the sans letter shapes makes them more readable on all computer devices.</i>	
4.1 Use an open source sans-serif typeface. <i>The simplicity of the letter shapes is more readable, digitally.</i> <i>Sans-serif letter shapes are generally simpler and free from decoration.</i> <i>The letter shapes are also generally of consistent weight and spacing.</i>	○
4.2 Use a large font size, or make explicit controls to change size. <i>Consider including explicit text size controls.</i> <i>Maximise readability to provide the occipital lobe with enough info.</i> <i>As people age, their eyesight ability declines.</i>	○
4.3 Use bold text, alongside clear, concise, statements. <i>Useful to highlight important information (see 1.1 and 1.2).</i>	○
4.4 Avoid using multiple fonts, unnecessarily. <i>This may make the interface and content confusing.</i>	○
5. Images and Multimedia <i>People with dementia can misinterpret videos and images for real people. Keep images and multimedia simple and relevant.</i>	
5.1 Keep images relevant and closely related to the content. <i>To reduce the chance that the interface and content is confusing.</i> <i>Make images simple, engaging and meaningful.</i>	○
5.2 Use autoplay where audio or video is the only focus. <i>See 5.4 and never autoplay on the landing page of a site (shock)</i>	○
5.3 Provide subtitles or transcripts for video and audio content.	Δ
5.4 Use very simple and familiar playback controls. <i>So that it's predictable and easy to control the content playback.</i>	Δ
5.5 Provide enough time to use and control content. <i>Movements are slower in older people, also D. w. Lewey bodies.</i>	○
5.6 Pictograms and icons <i>Judicious and validated use of icons can aid recognition and function of UI controls.</i>	○

5.6.1-Service Elements

In order to deliver user-centred experience, logo, colour, visual system and font were built.

Visual Metaphor System

The name of the service proceed from remind your memory like rewind the video tape.

Remind your memory like **rewinding the videotape.**



Logo metaphor



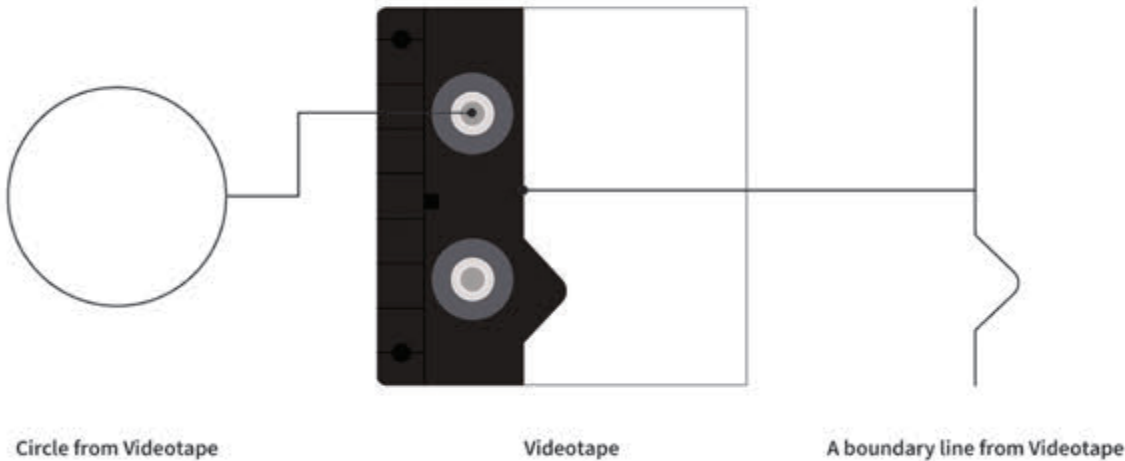
A pile of video tapes about memories



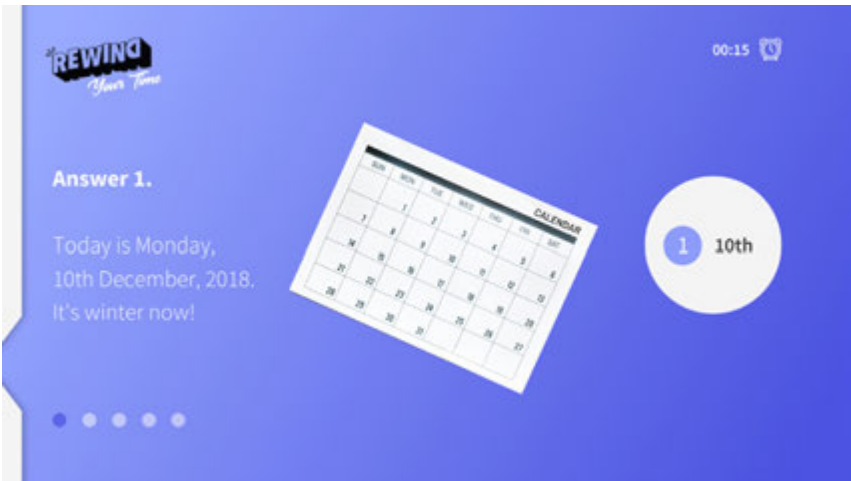
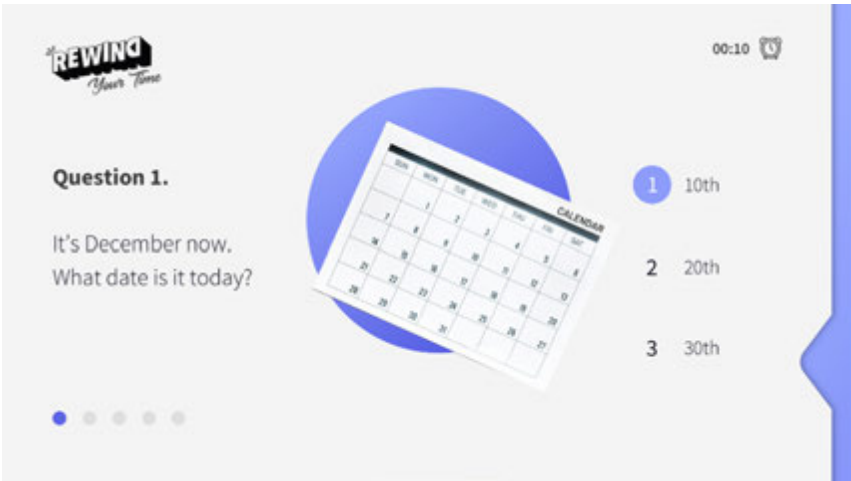
3D type design

The visual metaphor of the logo is from a pile of videotapes' shape. Each tape presents the user's memories and histories. Therefore, this logo contains the meaning of rewind each memory a day.

Graphic metaphor A circle and a boundary line also be used for the visual metaphor to screen design. The circle is used for concentrate user's attention to the photo. And the line is used for divide question and answer screen. This layout design came up with when we took the video out of the cover.



The layout design of the app screen
- Question screen
- Answer screen



Logo System

This logo's centre is transparency for avoid user's attention to the logo. It is pervasive to the back-ground image. Therefore, when user enter the screen, they can focus on the main content.



White Background



Black Background



Bright Background



Dark Background

Colour System

‘Vivid colour and high contrast’
Rewind has five categories, so it has five highlight colours. Each colour represents the meaning of emotion to the dementia patient. Especially, violet is the colour which represents Alzheimer's disease. Thus, this colour used in 'Rewind your love' category which is the question about patient's family members and their emotions.

Highlight colours



An example of colour Usage

Question 1.

Title
Source Sans Pro Bold

It’s December now.
What date is it today?

Body text
Source Sans Pro Light

1. 10th

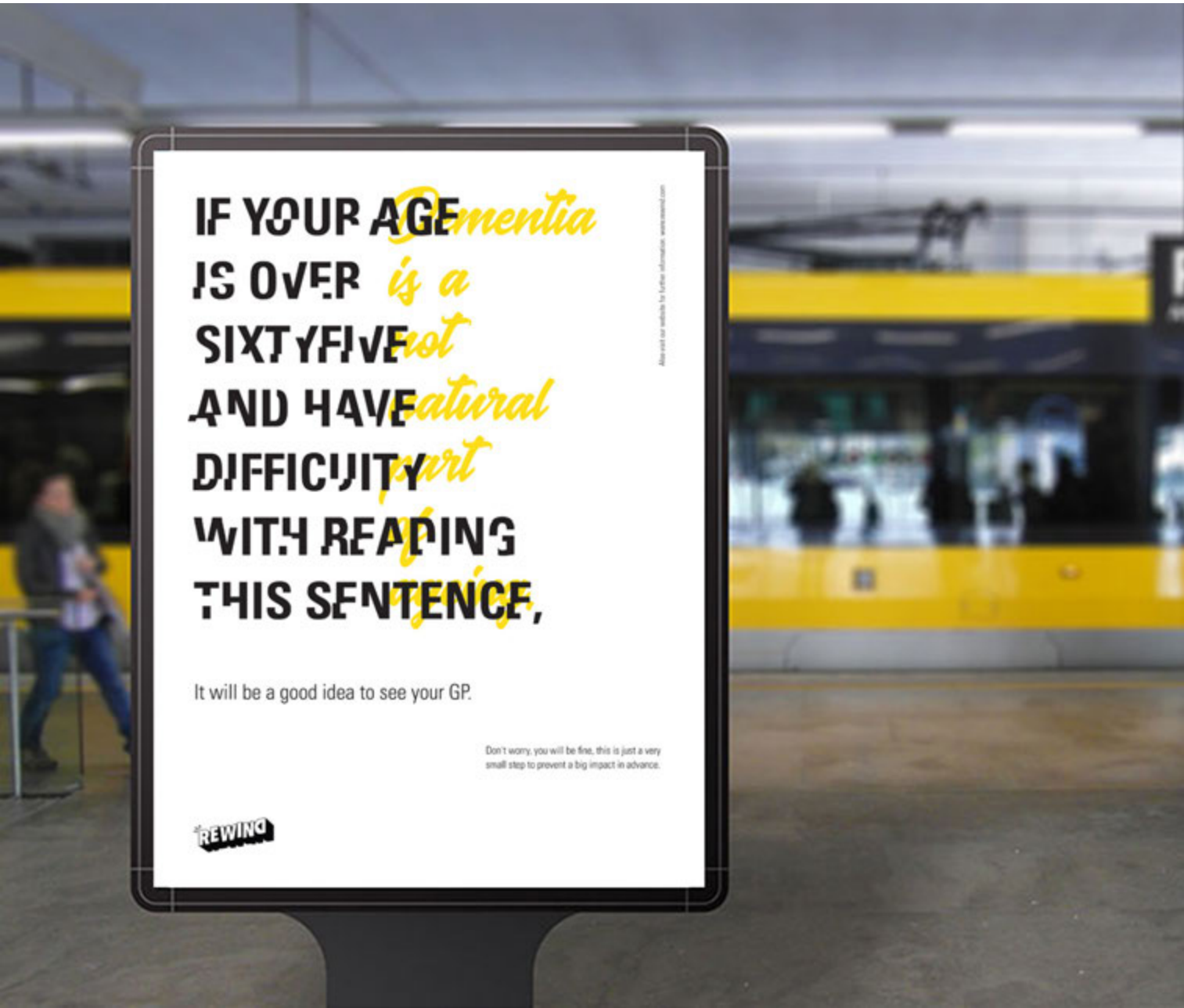
Small Title
Source Sans Pro SemiBold

Source Sans Pro is google open san-serif font which has simple shape and free from decoration. The simplicity of the shape is more visible and readable, digitally.

5.7-Rewind

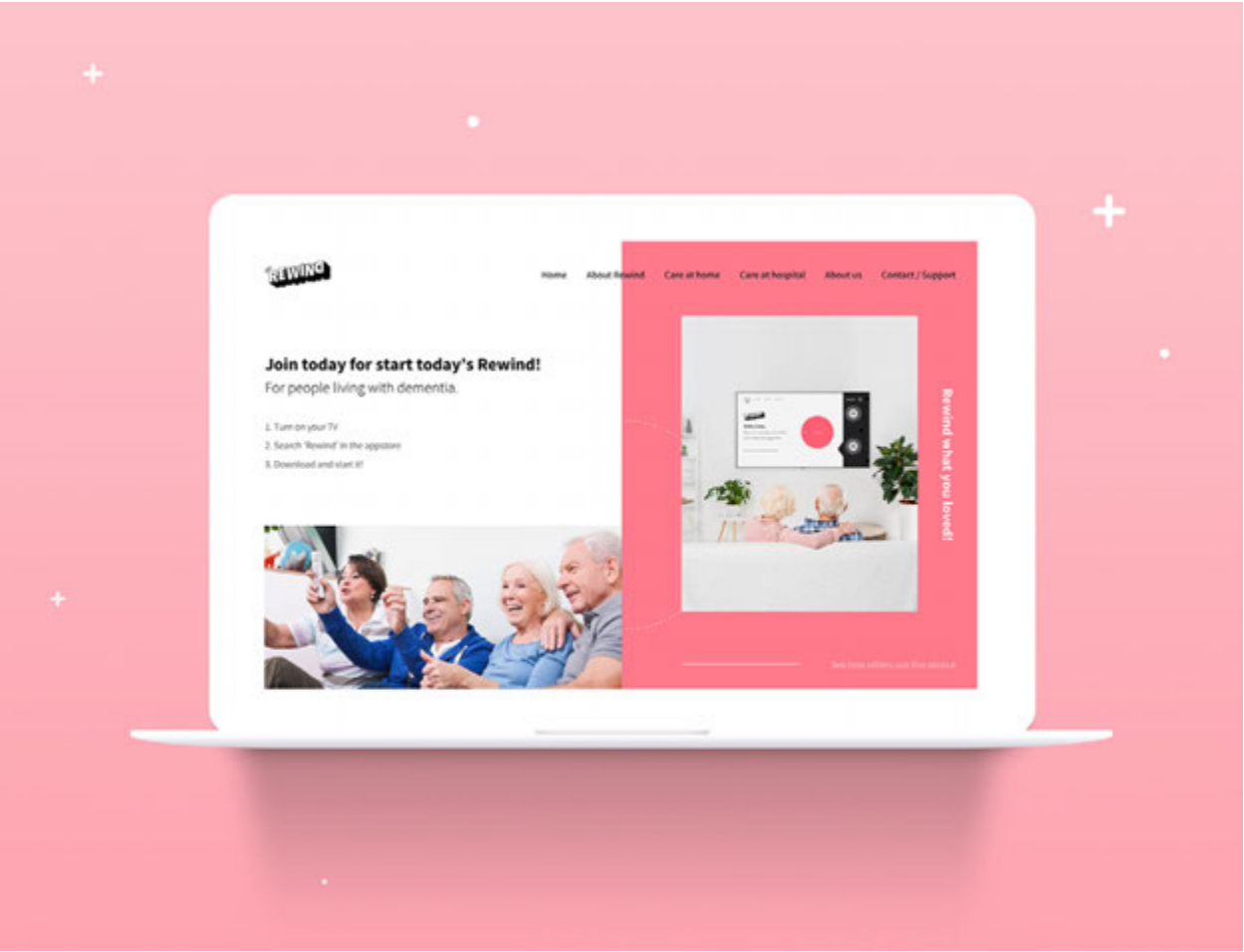
5.7.1- First touchpoint : Promotion

The early sign of dementia can be detected earlier. However, they usually think they will be fine, thus, they don't visit GP. This behaviour pattern makes the proper treatment delayed. As the first touch point of the service. this poster can be a simple screening tool for elderly people.



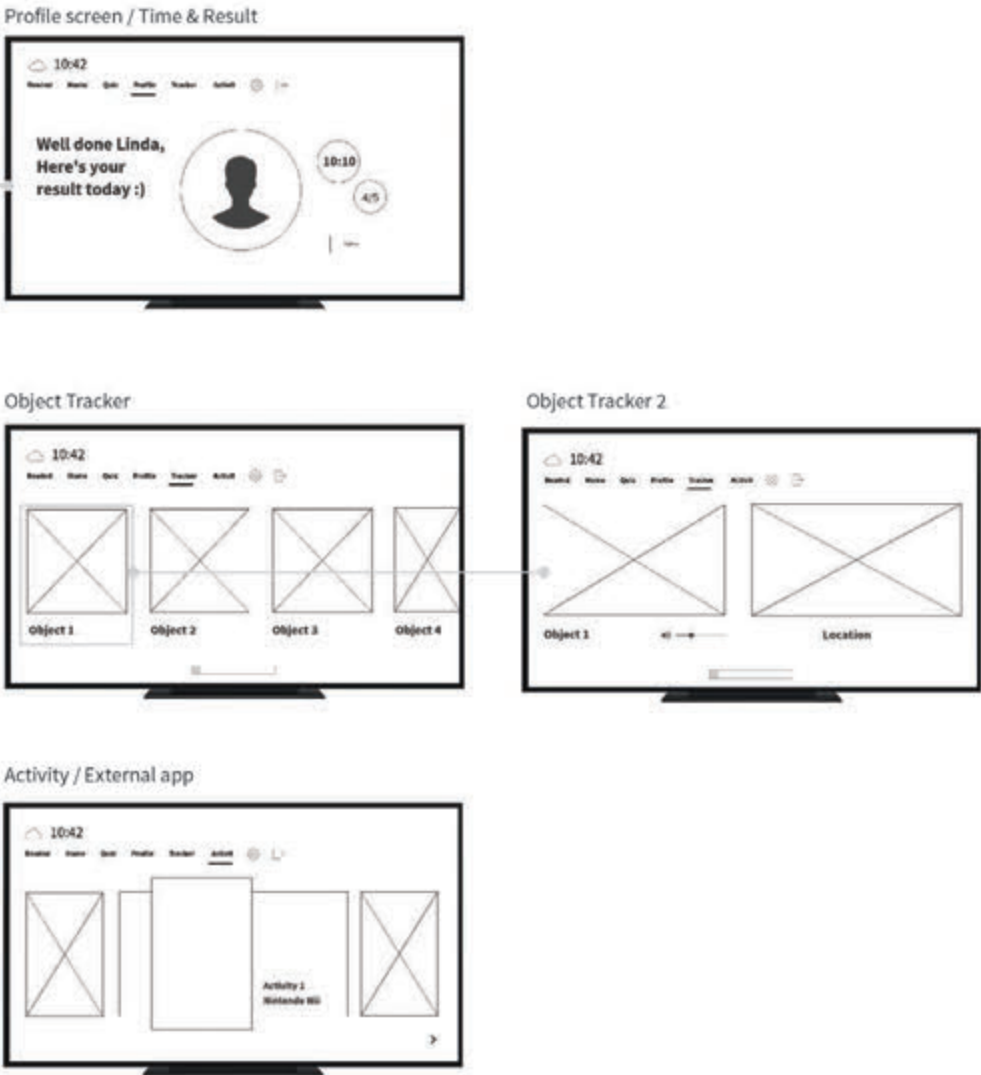
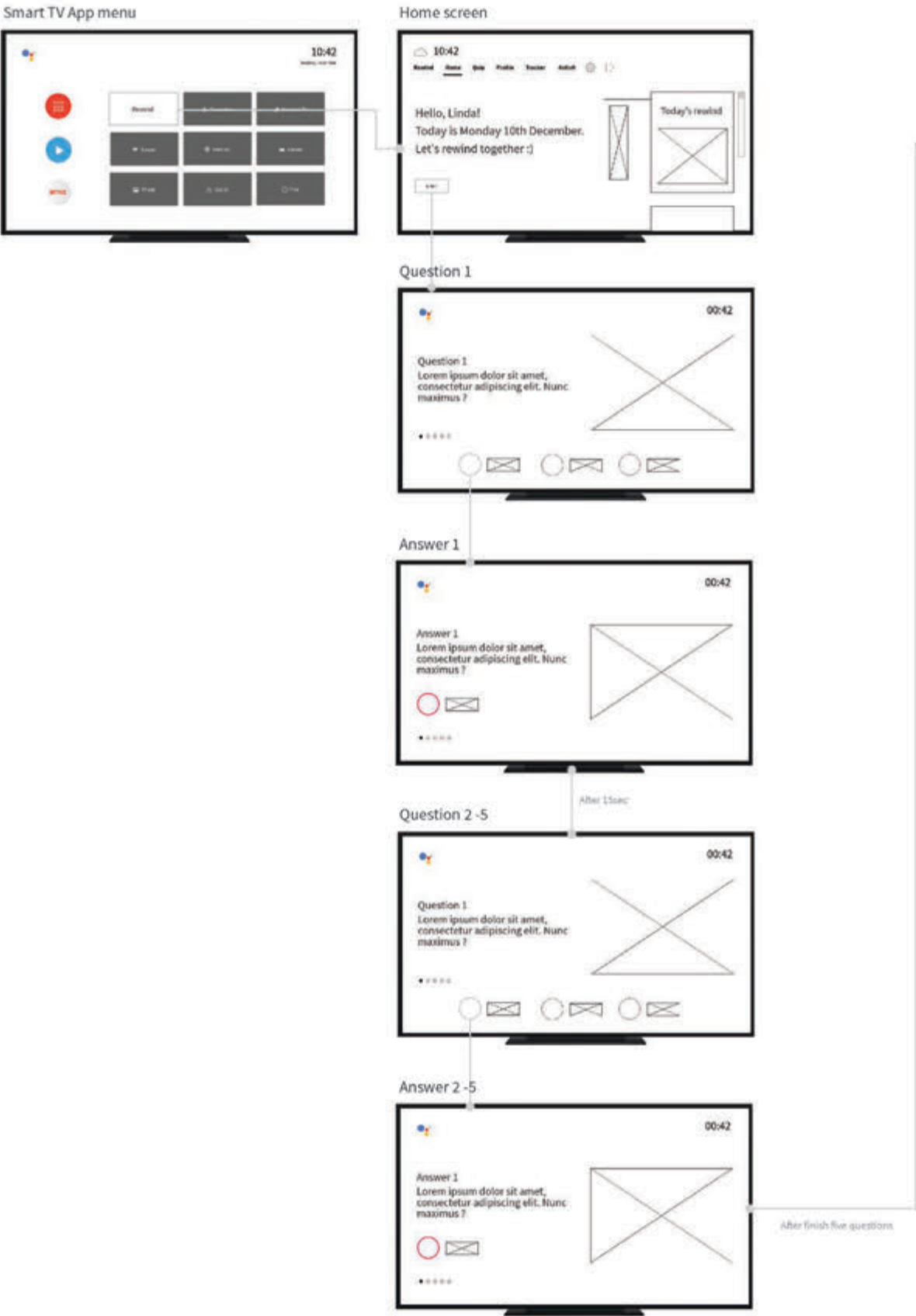


Rewind Website

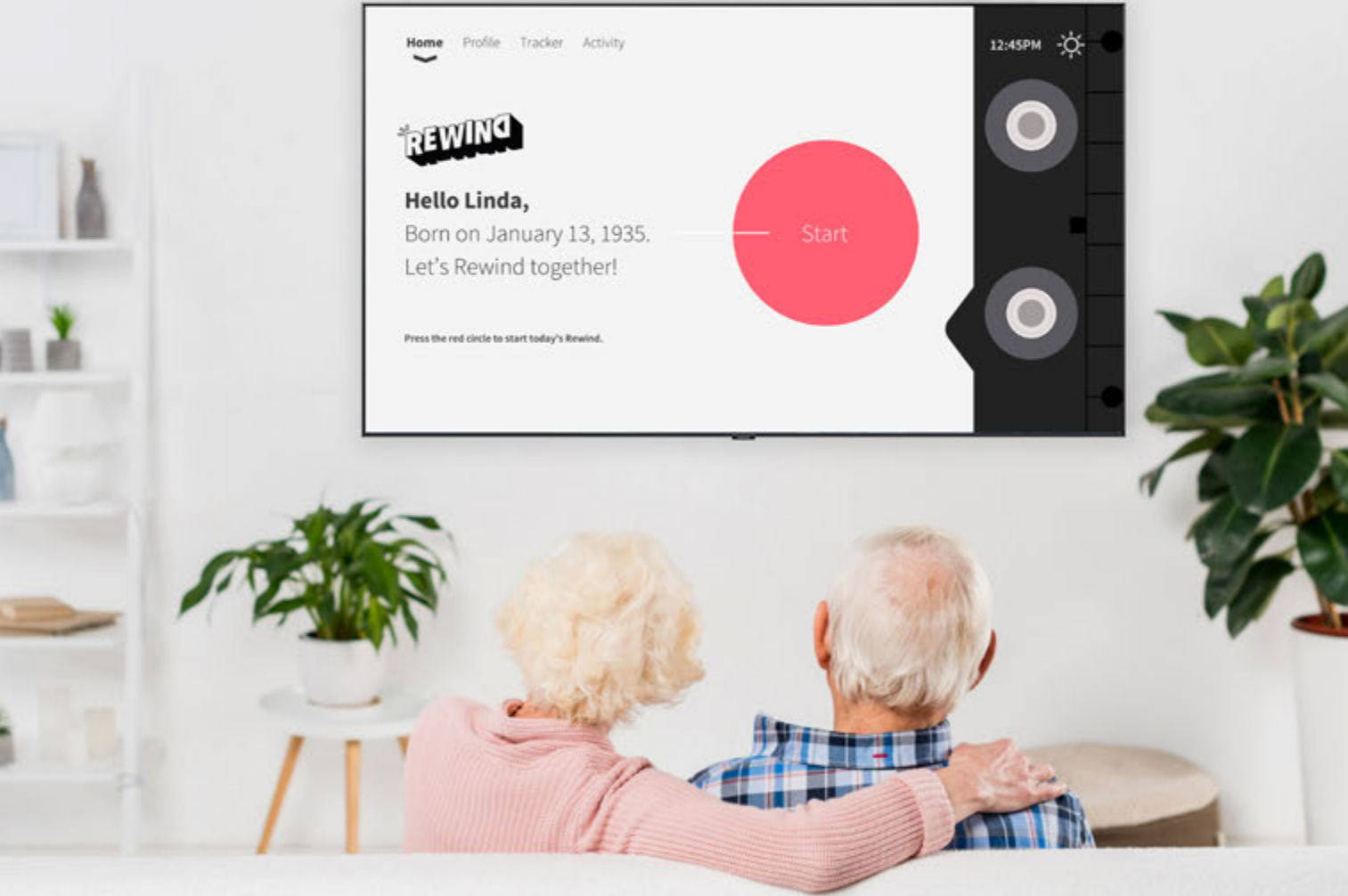
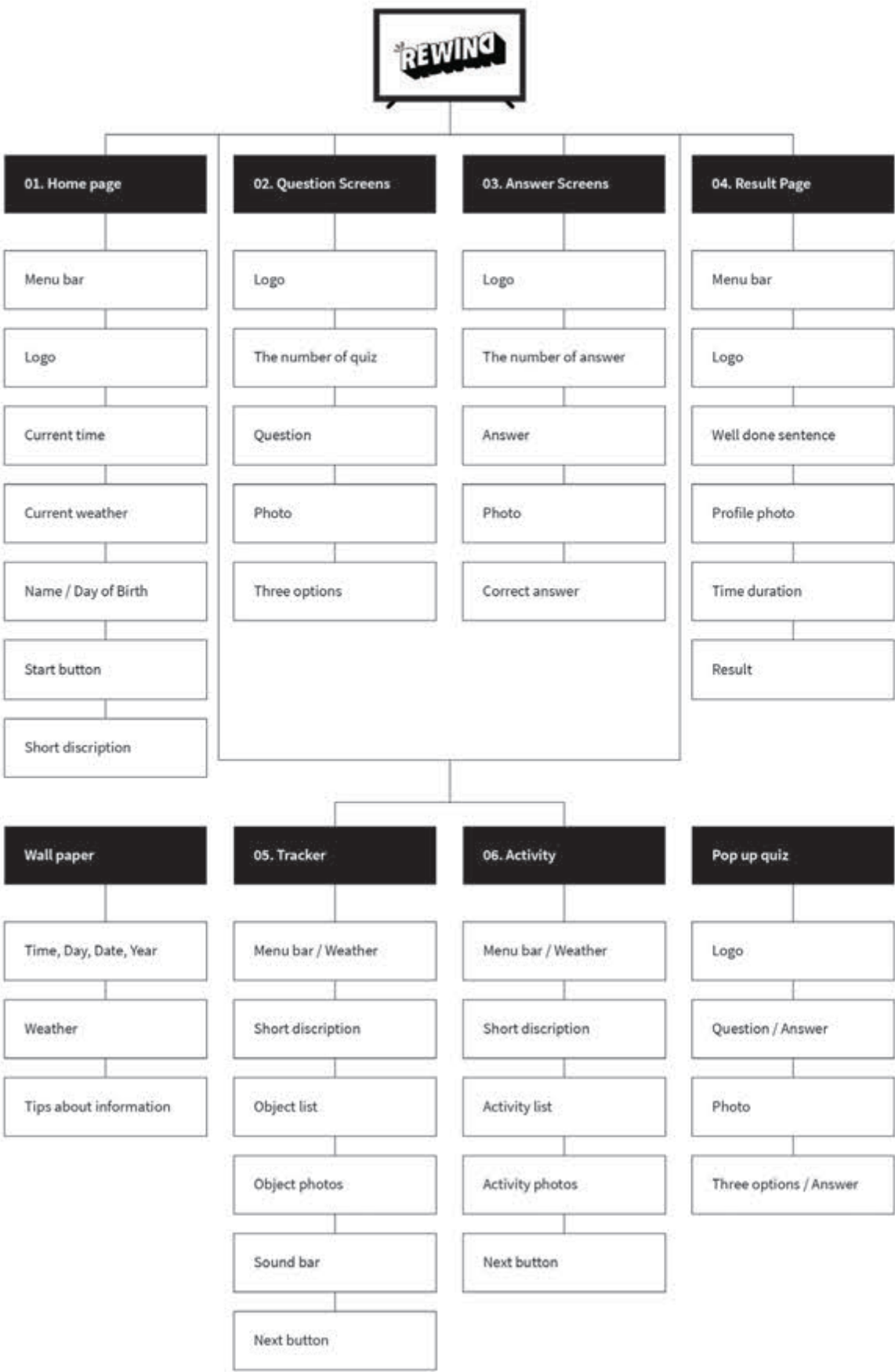


When user accessed to 'www.rewind.com' they can be referred to this website. The information about how to use service, how others use the service, detailed information about each application, data protection and submit enquires and get some support.

5.7.3-Rewind for Dementia
Patient: Smart TV Application



Wireframing

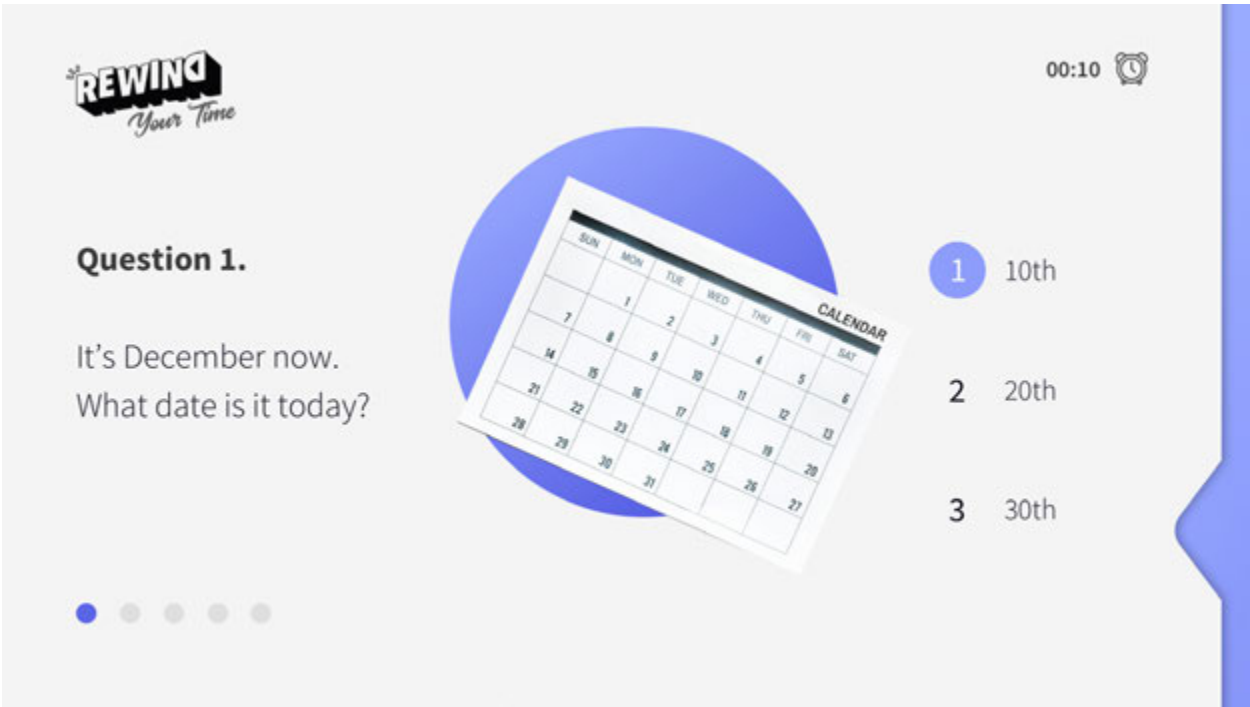


Screen design

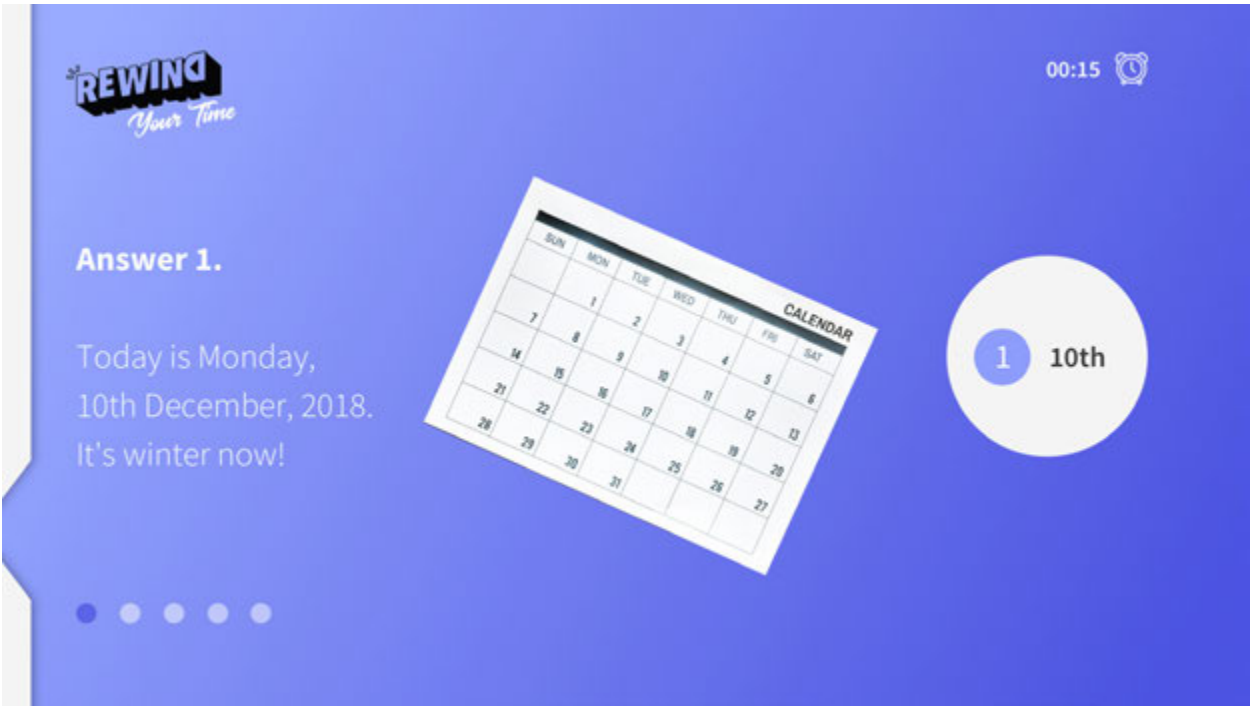
Divide the quiz section and the answer section clearly with apply different background colours so that user can recognise where they are.

Using different colour for different section, users may not confusing about the quiz.

01. Rewind your time

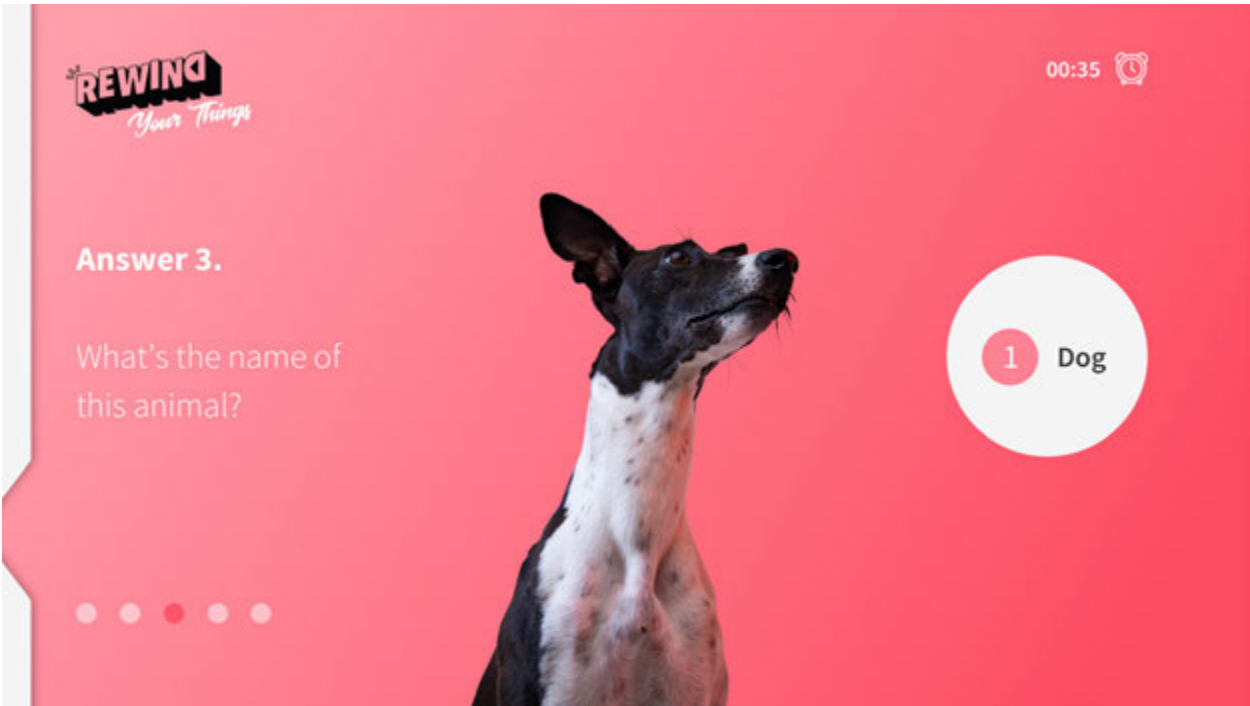
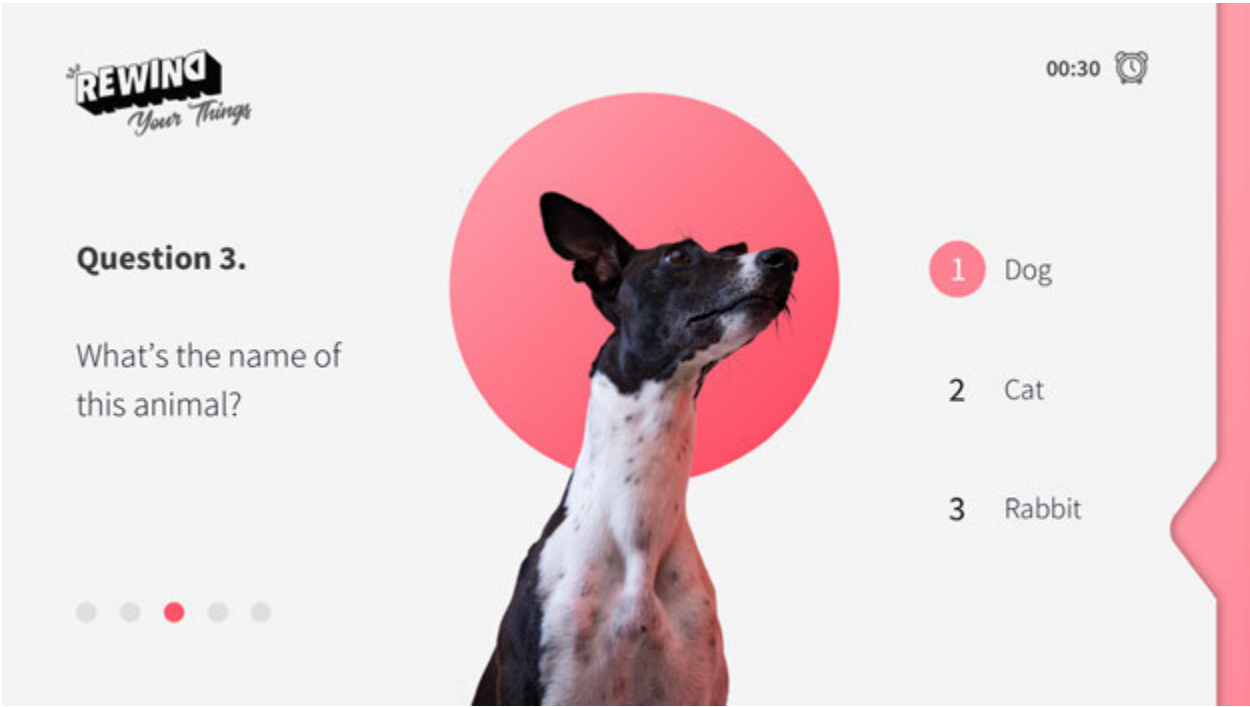


02. Rewind your math

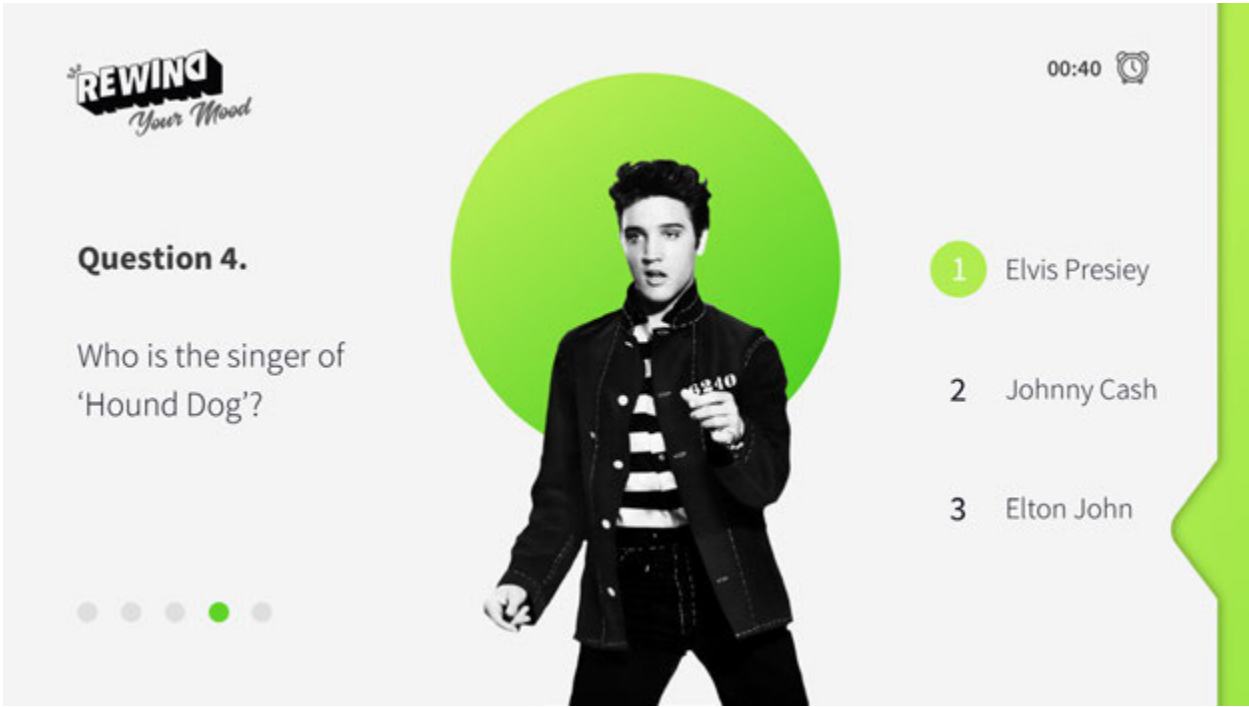


Divided question area and the list of answer area offers users to recognise contents clearly.

03. Rewind your things



04. Rewind your mood

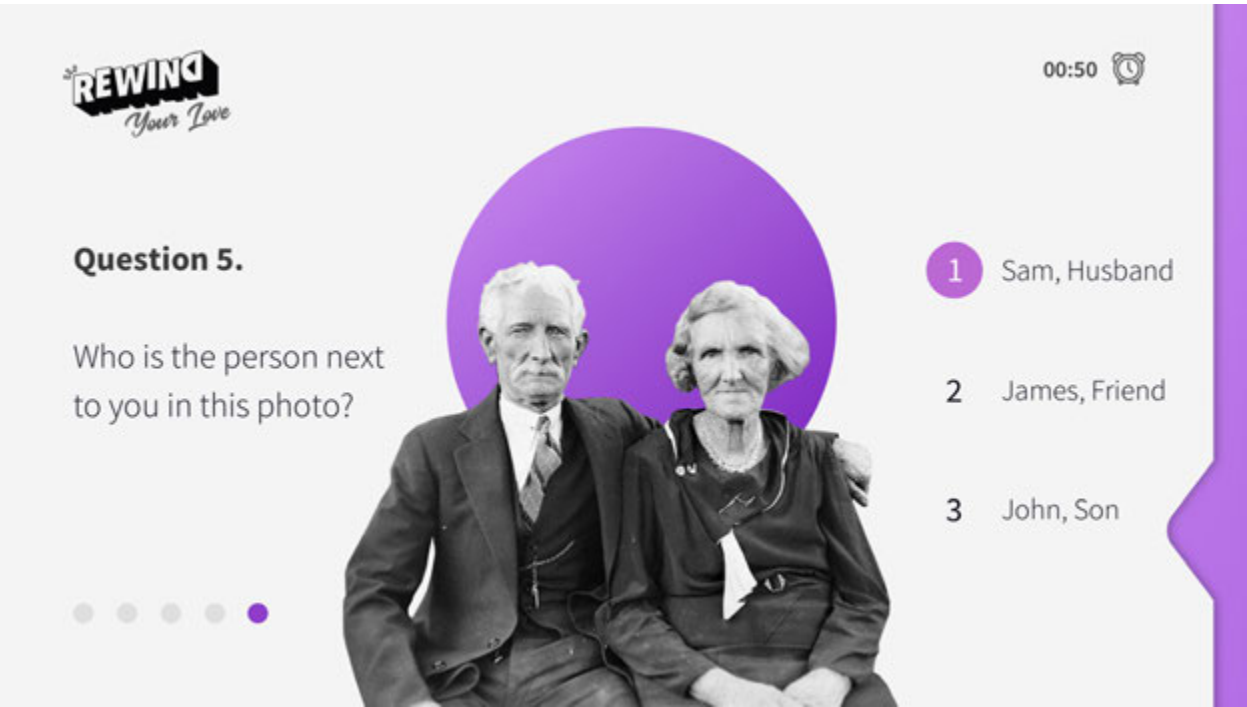


Using coloured circle as a background graphic, users can concentrate on the image even it is black and white. Users may not distinguish contents if all the elements are in the same colour tone. Music will be played in this section for better recall memory.

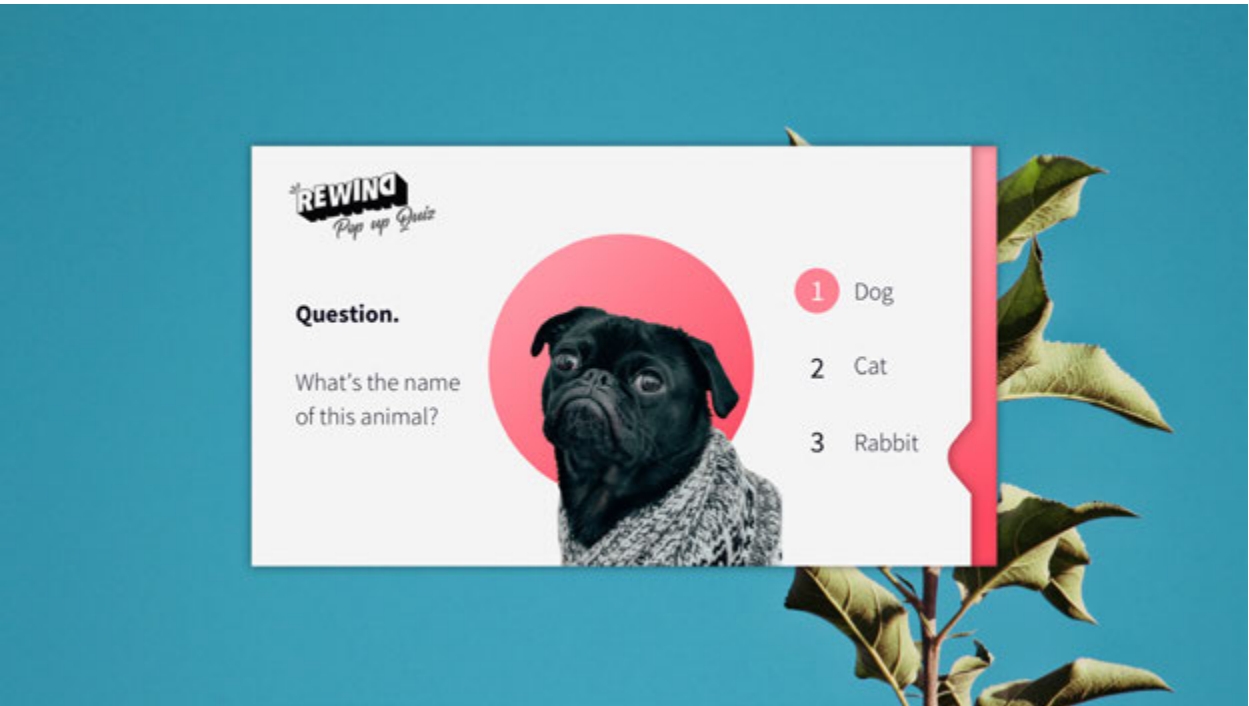
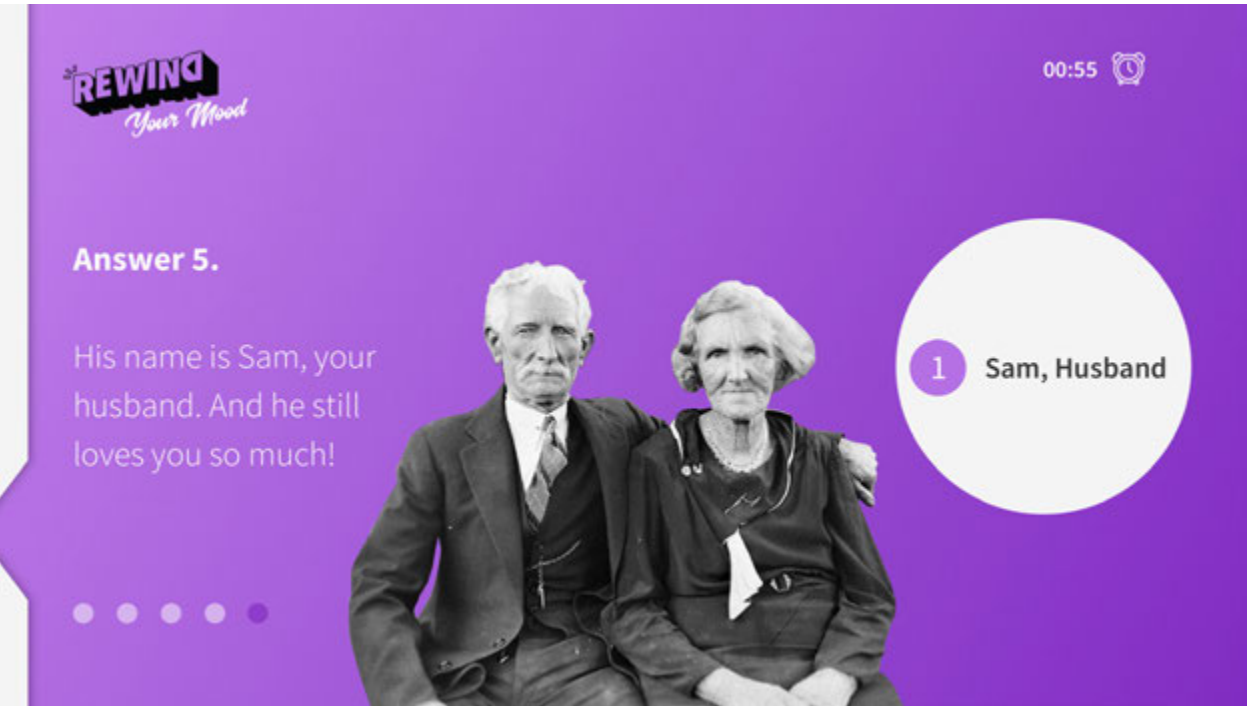
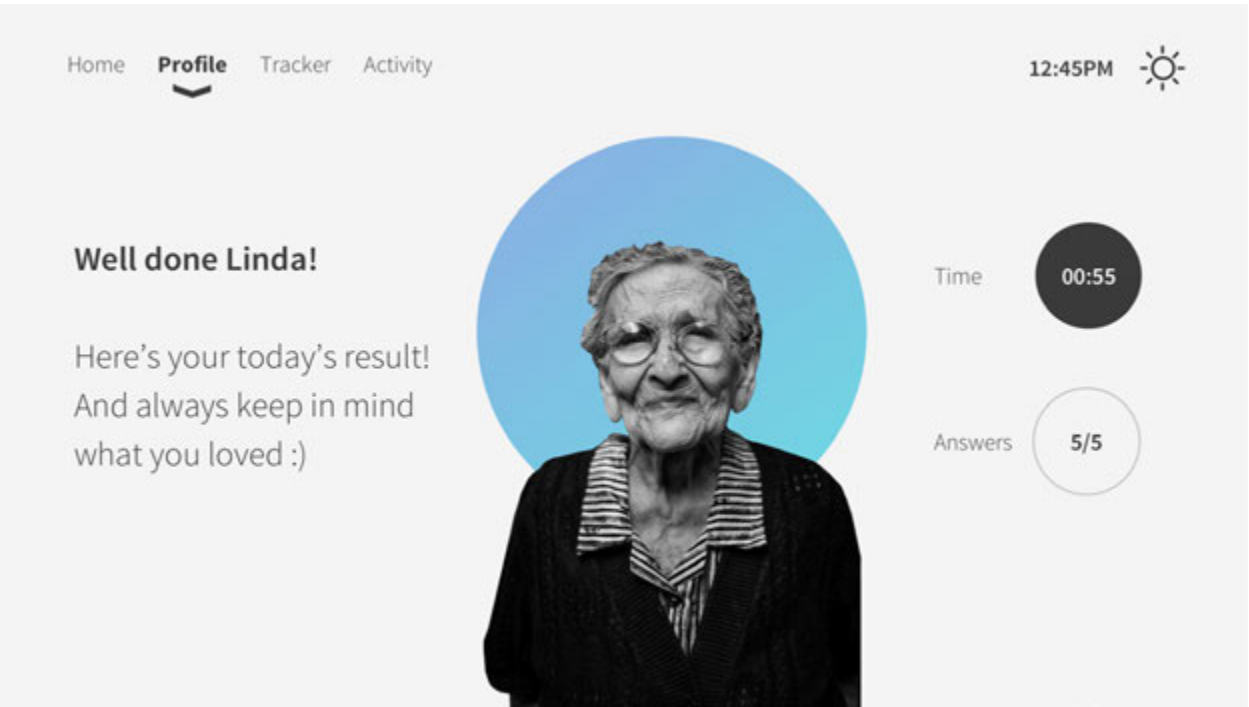
Reflected caregiver’s opinion, remind them about their family love you.

When they enter the wrong answer, the quiz continues to appear until they enter the correct answer.

05. Rewind your love

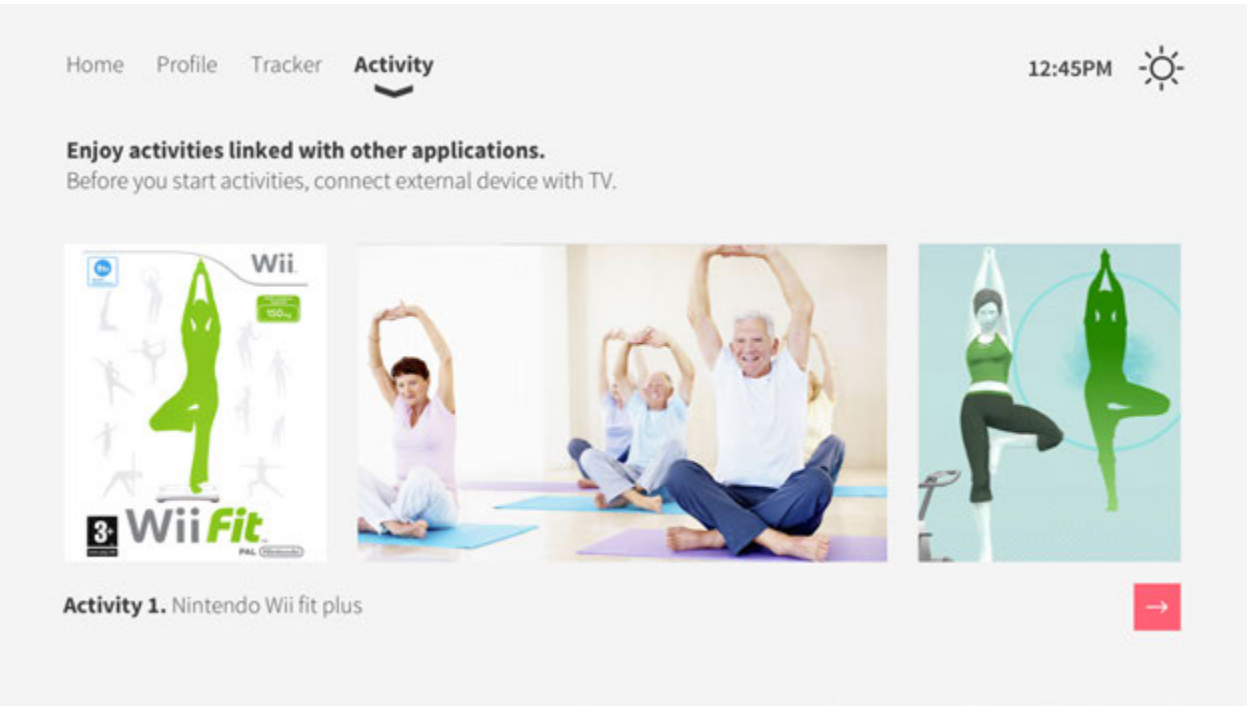
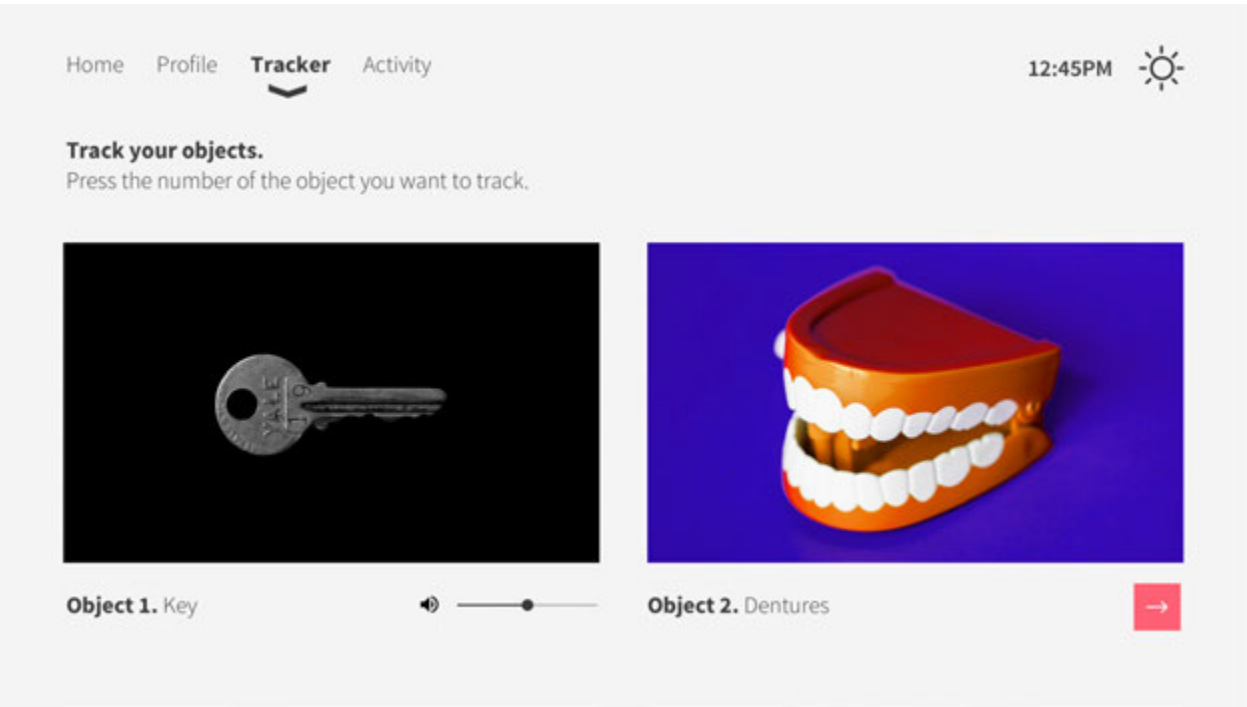


06. Result / 07. Popup quiz

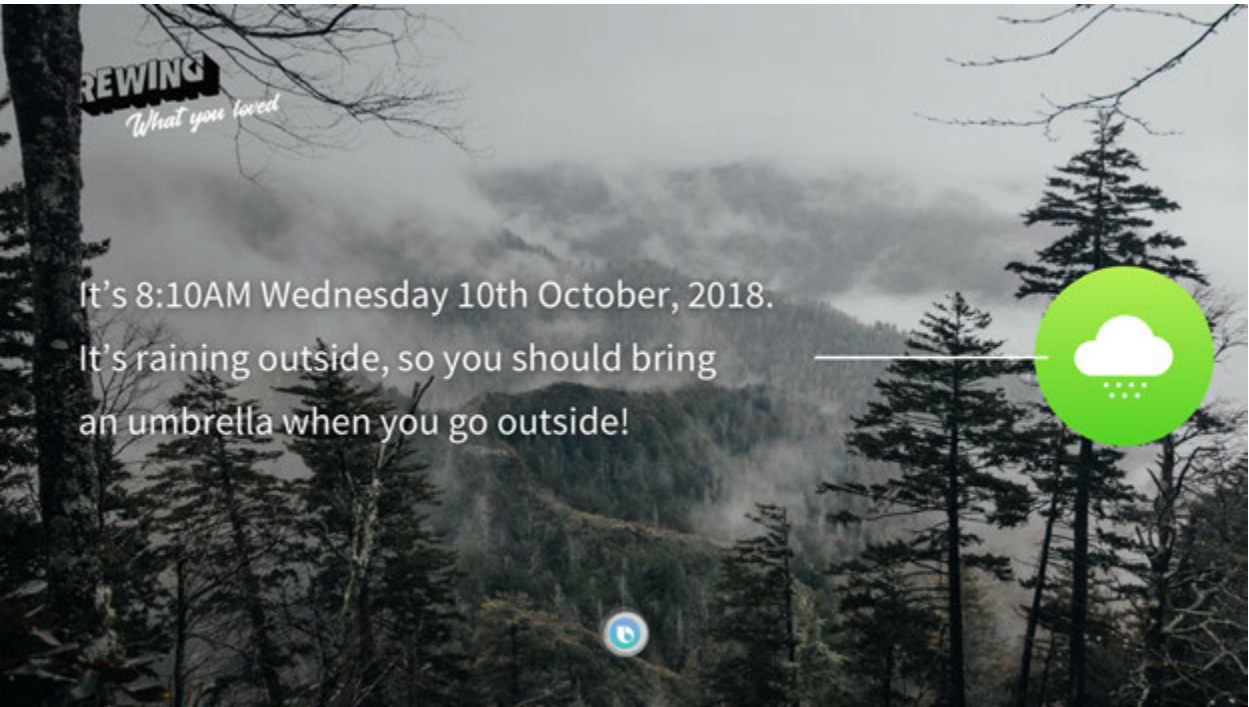


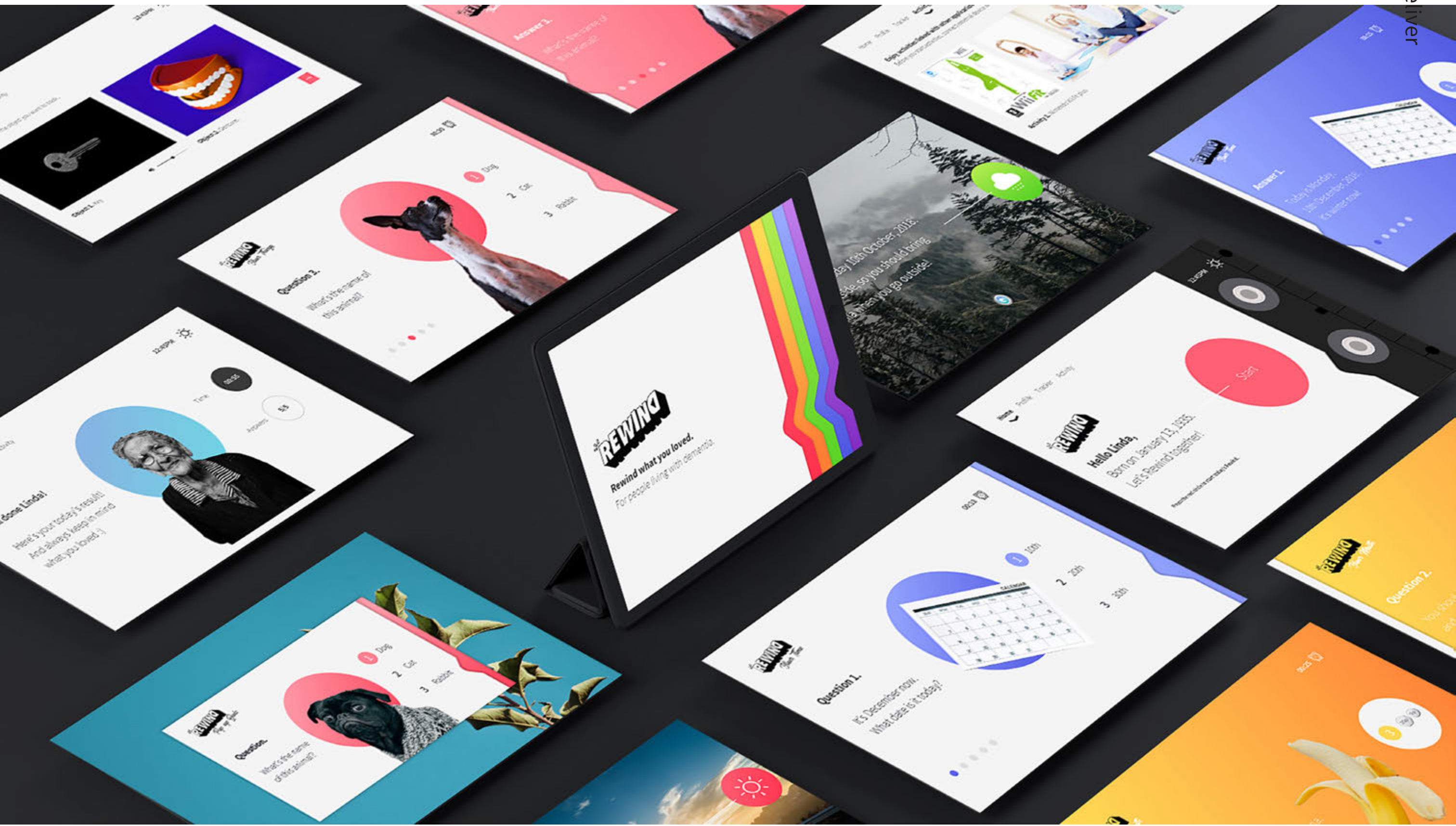
Users can open the application with the voice recognition.

08. Object tracker / 09 Activity



10. Wall paper





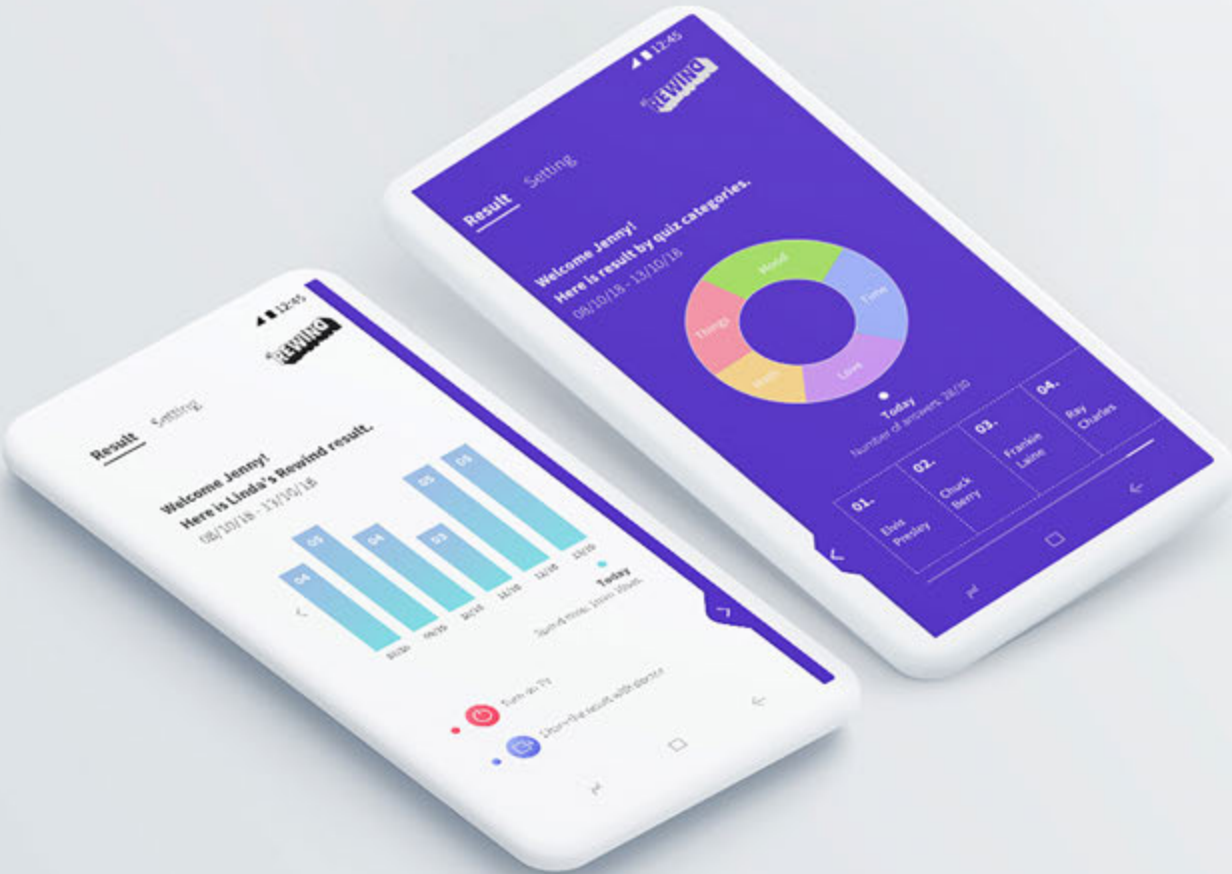
5.7.4-Rewind for Caregiver: Smartphone Application

Flowchart



Screen design

Carers can assess the result of the quiz which is divided by date and categories. Also, they can check the history about the quiz and the following result of them.



5.7.5- Rewind for Doctor
: Image file



The result of the quiz classified and exported to the image. The doctor can receive the result via email. In this image file, the doctor can access the history of quiz content, time duration for each section, the number of correct answer & category, the number of incorrect answer & category and the change of total result compared to the previous office meeting.

5.8- About Data protection

Rewind Data Protection

‘Remindme Care (2.2.1)’ was used as examples to assume Rewind’s data protection. Rewind encounters a variety of stakeholders. Users input their data and service provider, and the external medical service provider receives the data. The user’s valuable and sensitive personal and medical information will be responsibly managed and used within our data protection system. The list below was referenced to the ‘Remindme Care’ website ‘Data protection & GDPR’ section. (Remindmecare.com, n.d.)

Data Collection

The service provider and external medical service provider can assess a patient’s name, age, symptoms, the results of the quiz, and the duration of using the service. The family members’ photos and information will be encrypted and stored in the system for creating quizzes, and it will not be shared with anyone.

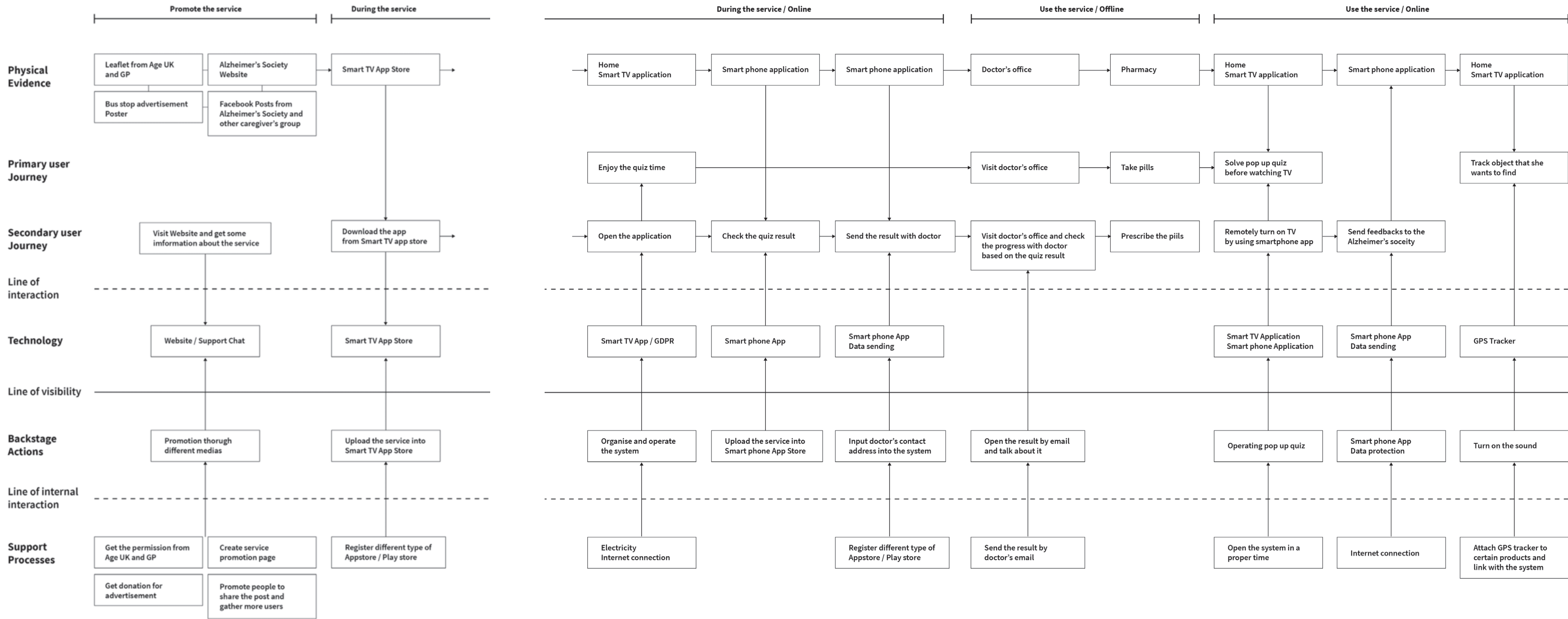
Data Hosting

The UK’s NHS G Cloud compliance requirements and ICO will host the data on a secure server.

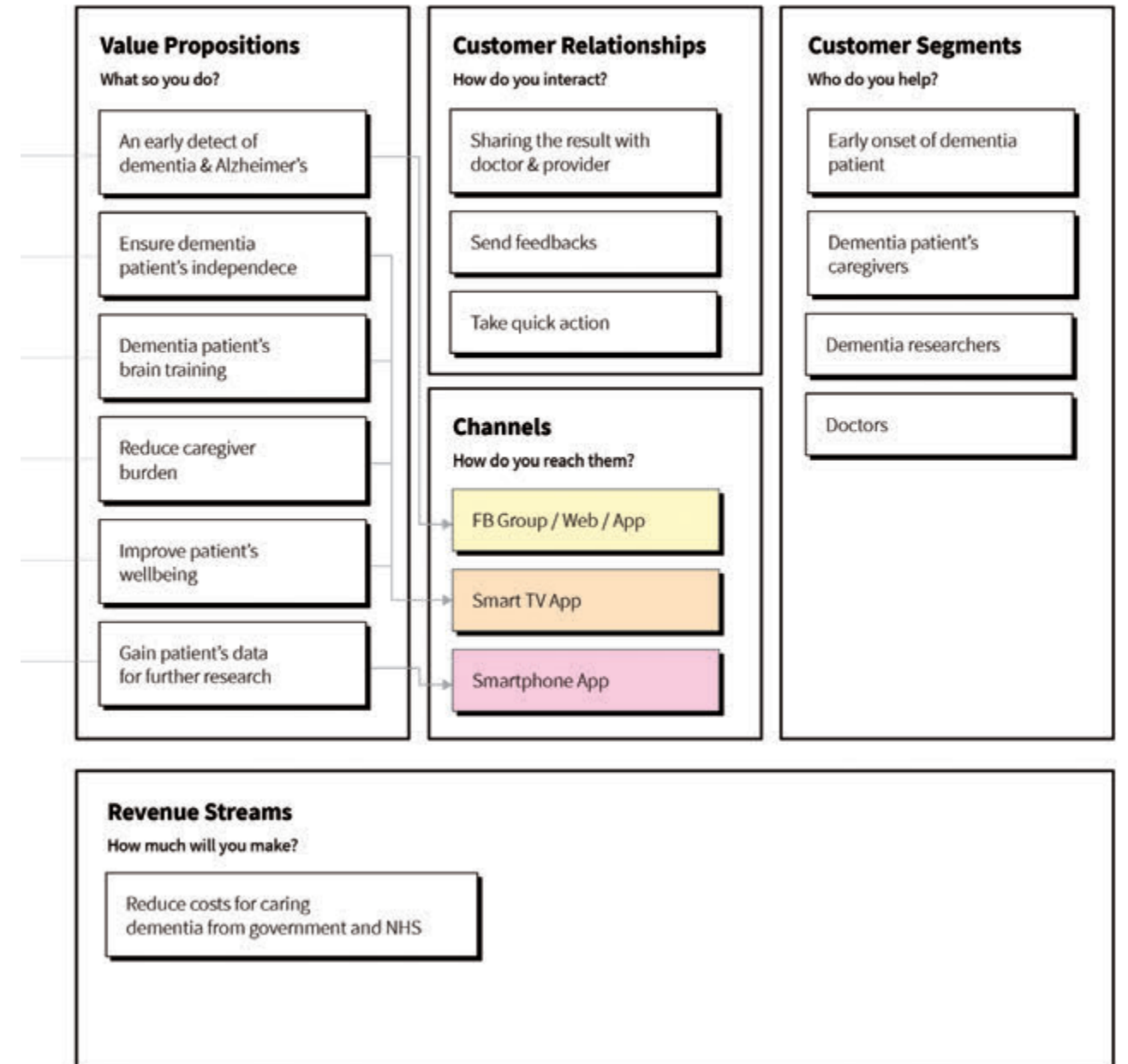
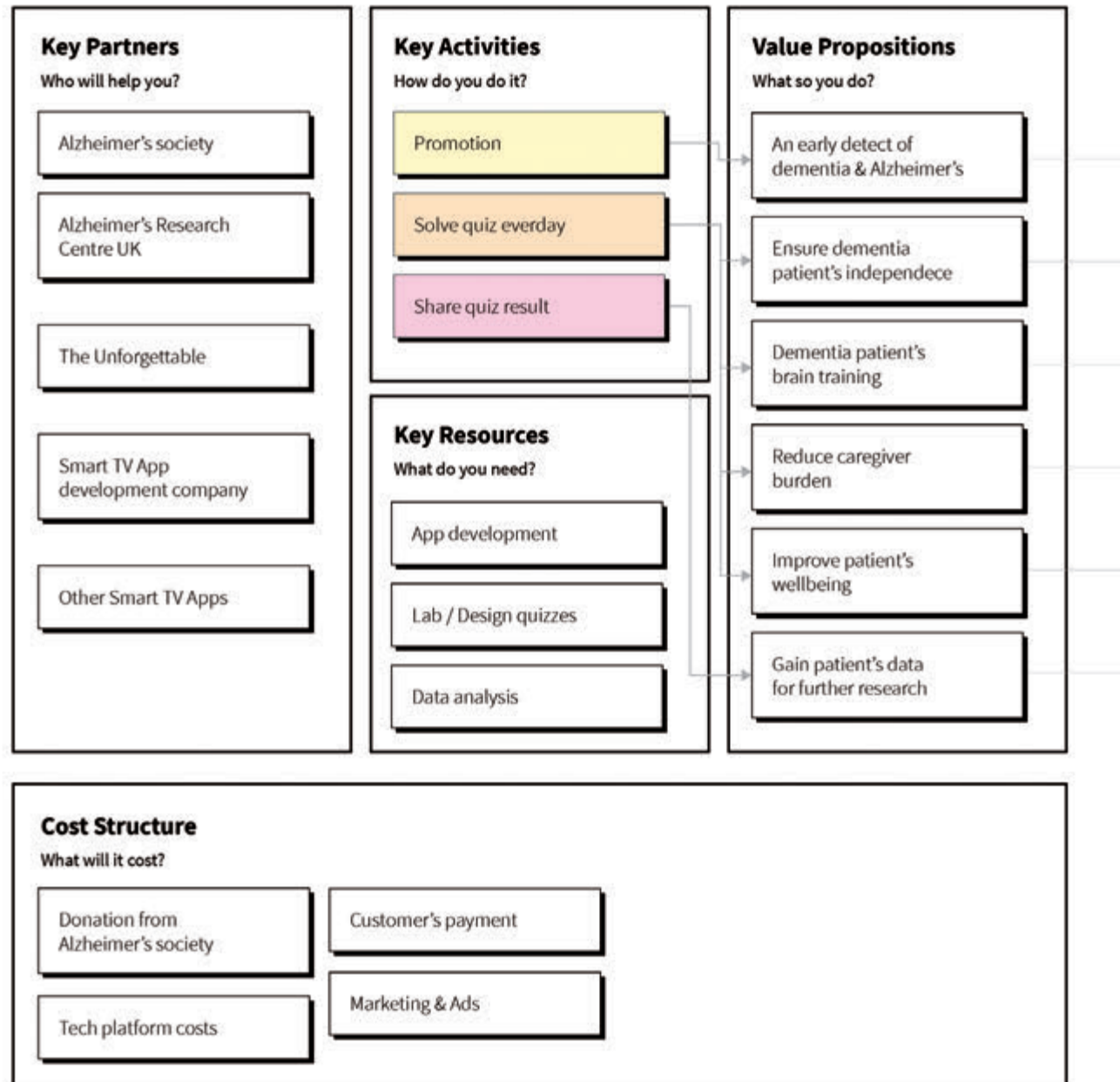
Data Portability

The user’s data will be made available to care facilities, such as the GP, the hospital, the memory clinic, and the dementia care home in a compliant and secure manner.

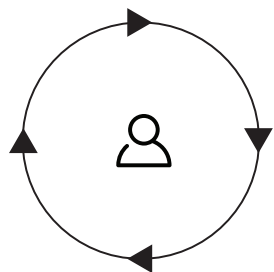
5.9- Service blueprint



5.10-Business model canvas

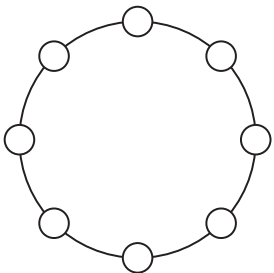


Related to these insights, Rewind will create value for users, the community, and the world. The contents of Rewind will provide a better life for users, it will offer community engagement, and it can contribute to reducing the cost of caring and researching dementia and Alzheimer’s disease.



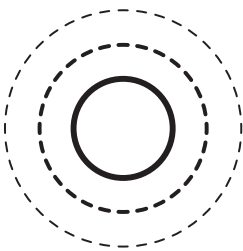
01
Ensure the patient’s and carer’s well being

The contents of the organised quiz is related to everyday tasks. Therefore, can be helpful with improving patient’s thinking skills and reduce the difficulties in doing everyday tasks. Also, it makes watching tv time more meaningful by memory training activity. Caregivers can divide their carer’s work with this service, such as keeping track of repetitive behaviour and reducing worries about patients who live separately from their families. By training the brain with quiz activity, Rewind can contribute to slowing down memory loss.



02
The circulating system for creating value in the community

The service provider is Alzheimer’s Society, which also collects data and feedback at the end of the service for further dementia research and improving the service. ‘Unforgettable’ which is the company sells dementia product is also in the system for suggesting to the user about the specific product which can be connected with ‘Rewind’ Their blog and caregivers’ club can be the platforms to promote the service and gather new users. The result of the quiz will be shared with doctors, GPs, hospitals, dementia care homes and senior care centres as supporting material to check the patient’s condition. Therefore, they can reduce the office meeting time and make the registration process more manageable.



03
Reduce the cost for caring and researching dementia

The Alzheimer’s society has conducted care research to improve the care and services available to people living with dementia (Alzheimer’s Society, n.d.). However, the amount of dementia research has been neglected by the government because of the budget. Operating Rewind as a research tool as well as providing the service can reduce the cost of caring for and researching dementia compared to the cases they provide separately.

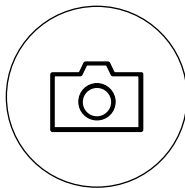
Expanding to the Smart Home service

When the Internet of Things is commercialised then now, Rewind, the smart tv application, can be a hub that connected with IoTs to provide better experience for patient's independence and safety.



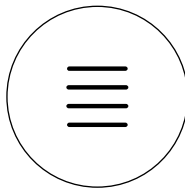
Lock

Lock the door when the patient came back to home.



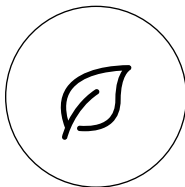
Security camera

Recording and sharing the video for safety and check the patient's location.



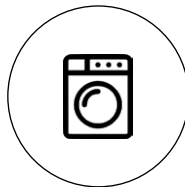
Blind

Pull down the blinds when time to go sleep & Raise the blinds when time to wake up.



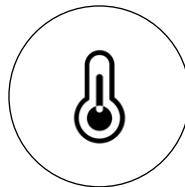
Irrigation

Tend the garden automatically.



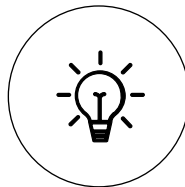
Appliance

Control appliance such as dishwasher and washing machine.



Thermostat

Control the temperature in the room based on the weather and patient's condition.



Lighting

Control the light based on the time and outside's condition.



Some types of technology may not be needed immediately, but it can be helpful to know what is available and what may be able to help in the future.- (Alzheimer's Society, n.d.)

The potential of technology assists in the well-being of people with dementia. To create a value-centred solution, the involvement of various stakeholders in the design process is needed.

Related to the insights, a new, innovative service should be needed for the increasing number of dementia patients and their caregivers, even the seniors who do not feel familiar with technology. Developing the service to support the care journey is one of the most necessary areas for people living with dementia. Rewind is a brain-training quiz platform that, with the help of technology, is organised with useful information about everyday tasks. For the user-centred approach, the quiz contents were designed to reflect caregiver, volunteer, and expert ideas.

As there are various types of dementia and diseases worldwide, the quiz content should be designed based on more specific data and medical grounds. However, this service is seen as a small step to ensure patients' independence and relieve caregivers' burdens. TV as a method of service delivery provides patients with a possible solution that can permeate their lives in a useful and friendly way.

When an app is connected with the community, it becomes a service, and Alzheimer's disease has various stakeholders in caring and researching areas, which means that the app also offers the opportunity to create more value from their relationships. Therefore, during the research process, it was important to collect feedback from the stakeholders' different perspectives. By assuming that Alzheimer's Society is a service provider, Rewind creates value that contributes to further dementia research. Furthermore, connecting with the medical stakeholders creates value that supports the assessment of cognitive impairment and checks dementia's progress.

Furthermore, if patients have their data, it could lead to a reduction in visiting time at doctors' offices so that one of the impacts we can expect is a reduction in the cost of caring, as well. To ensure this value, certification with the community and doctor should be taken a step further. The involvement of various stakeholders provides a better user experience and creates higher value.

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Major project report
MA Service experience design and innovation
London College of Communication
University of the Arts London

2017-2018

**How might we design a digitalised
memory-training program to
ensure dementia patient's independence
and reduce burden on caregivers?**