

# IPS AS A TOOL FOR DESIGNING TO IMPROVE THE CARE FOR PEOPLE WITH DEMENTIA

According to the World Alzheimer Report, nearly 50 million people are living with dementia worldwide in 2016, and this number is expected to increase to 131 million by 2050 (World Alzheimer Report, 2016). While the number of people living with dementia keeps increasing rapidly, currently there is no cure for the disease (Alzheimer's Society, 2018; World Health Organization, 2017b). Due to the fact that dementia is such an impactful disease, more focus should be put on how to improve the quality of life for those living with dementia, instead of just trying to find a cure (T. P. Ettema et al., 2005).

BPSD, defined as "signs and symptoms of disturbed behavior, mood, thought, or perception" are the most worrisome symptoms (Kales et al., 2015). In fact, this symptomatology has a high degree of frequency and is present in at least 50–90% of patients (Steele et al., 1996). Moreover, around 97% of PwD will develop at least one symptom over a five-year period (Steinberg et al., 2008). Due to the extensive spread among people with dementia, it is chosen to be the target group of this project.

This project aims to improving the care service for people with dementia who exhibits BPSD (Behavioral and Psychological Symptoms of Dementia) by providing the relevant stakeholders data insights, and meanwhile improving these people's working efficiency.

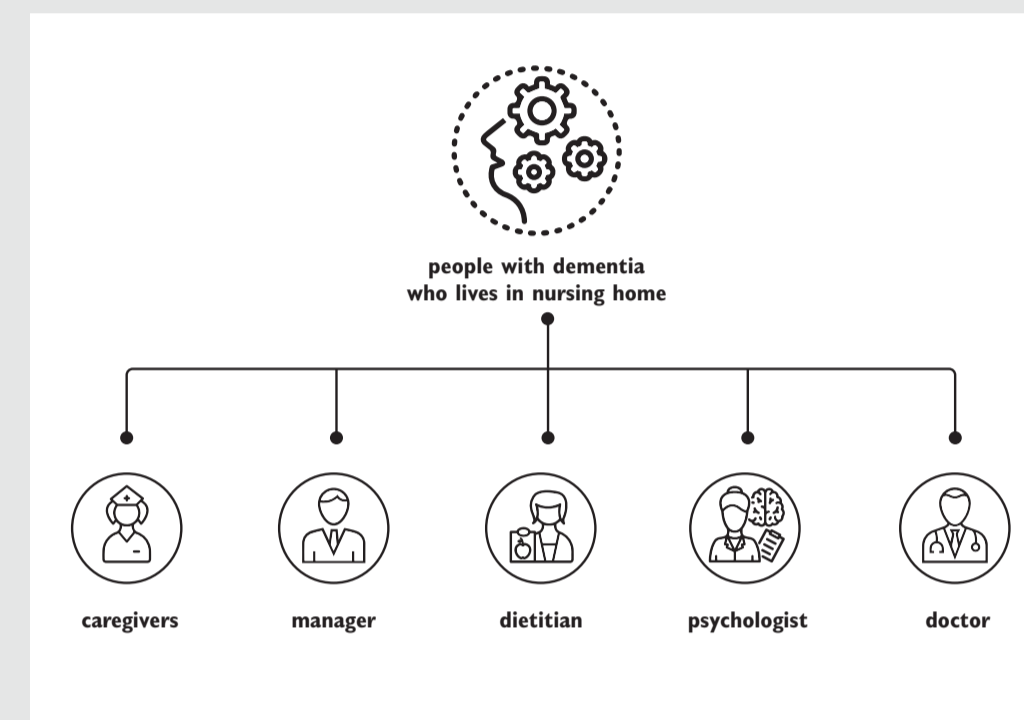
## What is IPS ?

IPS, Indoor Positioning System, can keep track of the location data of each People with Dementia (PwD) and their caregivers over time. Therefore, it can generate quantitative and objective data for the identified factors influencing BPSD which are location-related and other location-related factors which might influence BPSD for each PwD. Different types of data collected by IPS are showing in the table.

Time
1. The duration of PwD staying each room
2. The duration of PwD being physically closed to caregivers (Physically close" is defined to be that the distance between two tags is within 0.5m)
Distance
1. Distance traveled over they day by caregivers
2. Distance traveled over they day by PwD
Location
3. The total PwD's staying time for each rooms (The rooms are separated into kitchen, dining room, corridor, bathroom, bedroom)
4. The frequency PwD switching from each room

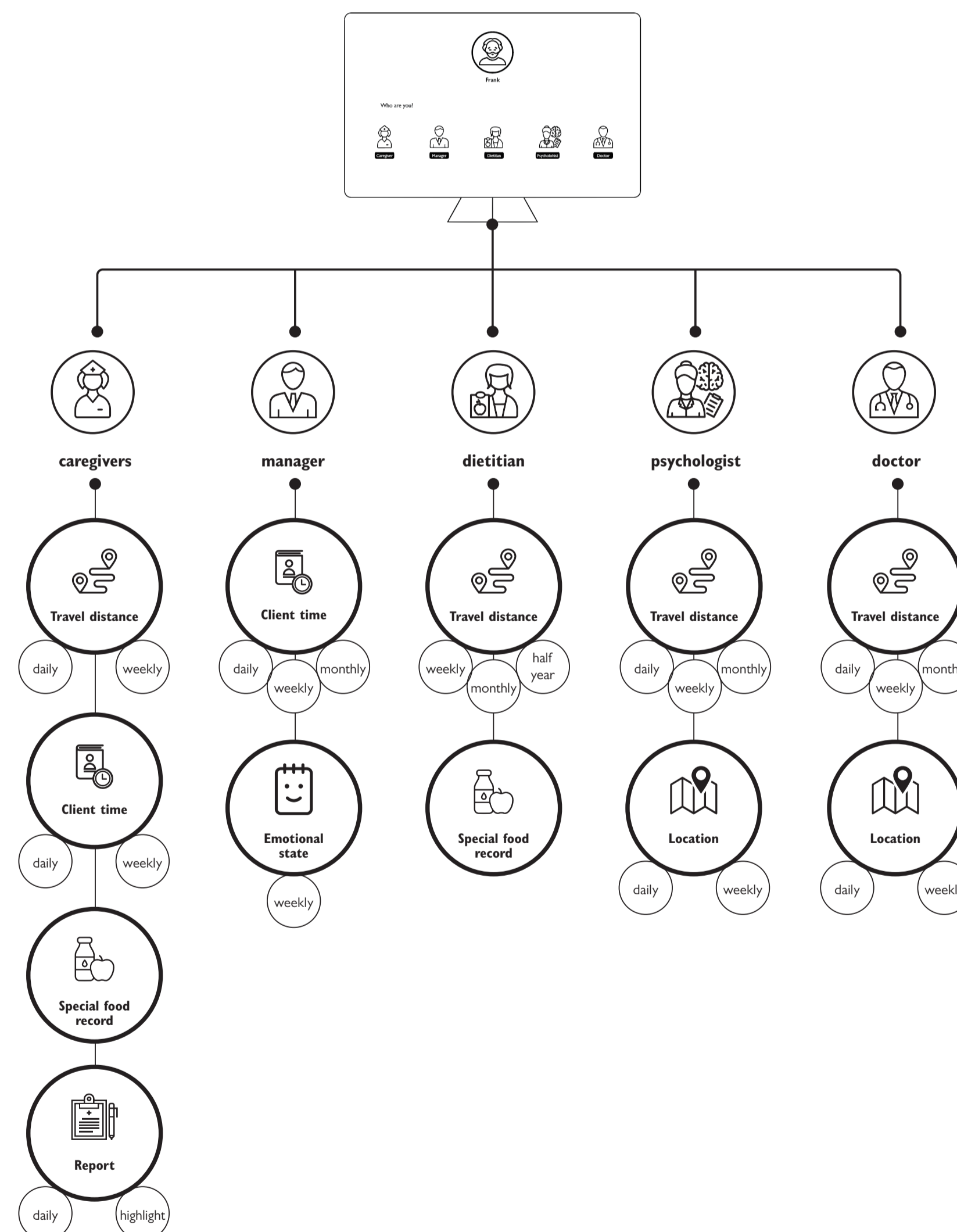
## Stakeholders for PwD

A map was created to give an overview about who are the relevant stakeholders. Caregiver, manager, dietitian, doctor and psychologist are selected to be the most important stakeholders when providing care service for people with dementia.



“ **Designing a new system to improving the care service for people with dementia who exhibits BPSD by using IPS data insight, Supporting the works of relevant staffs contributes to the care service.** ”

## Design outcome



## Design requirements



Personalized care plan

People with dementia who exhibits BPSD share very different characteristics, as presented in user profile, chapter 5. Therefore, one patient's behavior can vary from other's a lot. In order to provide good care service for every client, the plan should be tailored according to their behavioral characteristics.



Integrated with current system

Currently, caregivers and other staffs already work with several different systems, as presented in interview with different stakeholders, chapter 5. For the new system, it should be integrated with the current working system to reduce the requirements of extra work for stakeholders to encourage them to use.



Involving relevant stakeholders

In order to provide good care service for each client, it's necessary to involve all the people who are currently serving for this target group, as showed in stakeholder's map, chapter 5. By improving supporting their work and improve their working efficiency, the clients can get better care. Therefore, it's also important to enhance the connection between all the stakeholders, making the communication easier.



Combination of quantitative and qualitative data

IPS can generate quantitative data, while explanations are needed for this data. Therefore, it's necessary to combine the quantitative data with qualitative data which can be provided by their current working systems. And the combination of the data can present a more holistic view of the clients' situation.

## User scenarios



### After a short holiday

When a caregiver comes back after a three days' vacation, she wants to know if she has missed something important in those days. Therefore, she turns on the system and goes through the report interfaces. In this interface, her colleagues have highlighted the important things of each client, therefore, she can quickly go through all the information. Suddenly, she finds out there is a note she doesn't quite understand, so she looks at who wrote the note. Then she takes the iPad to find the colleague to ask about the details.

Comparing with their current report system which separates each piece of information for one client into separate pages, the new system can give caregivers quick access to all the important information of one client. In this way, caregivers can save their time.



### Before a meeting

Today is Tuesday, and in the afternoon, there will be a regular meeting among caregivers, manager, doctor and psychologist. This time, they are going to discuss Frank's behavior over the last period to decide if there is anything should be changed for him. Doctor will hold the meeting for this time. Two hours before the meeting, she opens the system, and goes through the weekly and monthly data of Frank. She finds that Frank traveled a lot more than before in the past week, while the client contact time is less than before. She believes that the two may be related, therefore she writes it down to be discussed in the later meeting.

Currently, there is hardly any meeting materials and no data for them to be prepared in advance. Thus, the information they received during the meeting was from the subjective opinion of caregivers. Sometimes, this information may be incomplete or misleading. The new system provides them quantify data to get prepared for the meeting in a more objective way.



### When client gets agitated

Marry (caregiver) works for nursing shift today, and this morning she spent most of time in clients' bedrooms helping them get washed. When she finished the cleaning task, she comes to the living room. She finds that Frank is very agitated right now, while he is the only one staying in the living room. Marry wants to know what happened before because when she was washing Frank this morning, he was quite happy. So she opens the iPad, and plays the animation. She finds out that 20 minutes ago, Frank, Nancy (another client) and one of her colleague were staying in the living room together. While, 5 minutes later, her colleague took Nancy out of the living room. Marry thinks Frank's agitation might be related to this, so she goes to find her colleague. Her colleague tells Marry that Nancy was shouting at Frank before, which makes Frank agitated.

The animation enables caregivers to review what happened before if they were not there at that time, which can be a good way to find out why the client get agitated.

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