Door System for Assisted Living Facility

Evan Fowler, Steve Kangisser, Cheyenne Raker

Intro

Why Assisted Living Facilities?

Baby Boomers are getting older. Soon, they will be coming to terms with all of the physical and mental changes that come with aging. Some people's minds will remain sharp until they pass away, but many others will be faced with some form of dementia in their lifetime. Currently, over 5 million people in the US are affected by dementia and this is expected to double by 2060 (CDC). In the future, more and more people will be living in Assisted Living Facilities, necessitating new construction and increased resources.
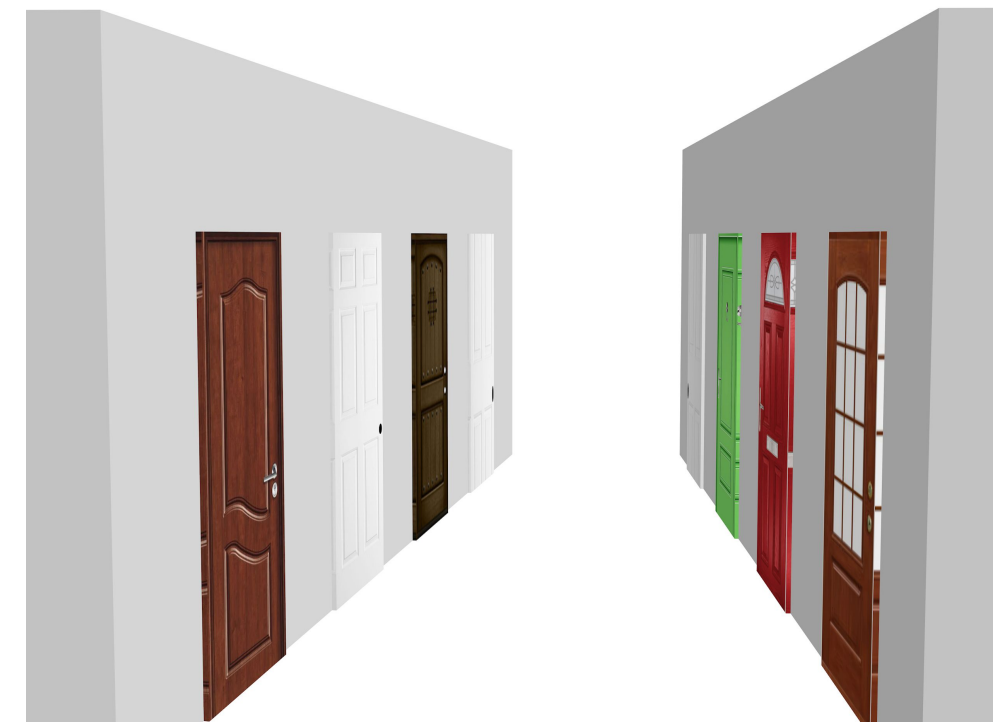
Although Assisted Living Facilities can provide much needed support for people living with dementia and their families, adjusting to a totally new context is very difficult for people experiencing problems with their memory. Many of us have experienced a moment of confusion when we step off of the elevator in a hotel and can't remember which of many identical doors leads to our room. Now imagine this feeling compounded with memory loss and happening to you most days--feeling lost within your own living space.

People with dementia often wander, especially at night, and sometimes they try to leave the Assisted Living Facility. This can lead to residents getting out of the facility without the supervision or support they need. This means staff spend a lot of energy trying to "guard the door," and family members spend a lot of time worrying.

Our project aims to alleviate these issues--providing empowerment for people with dementia living in Assisted Living Facilities and providing support for families and staff. The market for solutions such as these is only going to expand as the Baby Boomer population gets older, and we think that now is the time to start thinking about the possibilities provided by the combination of hardware and the Internet of Things.
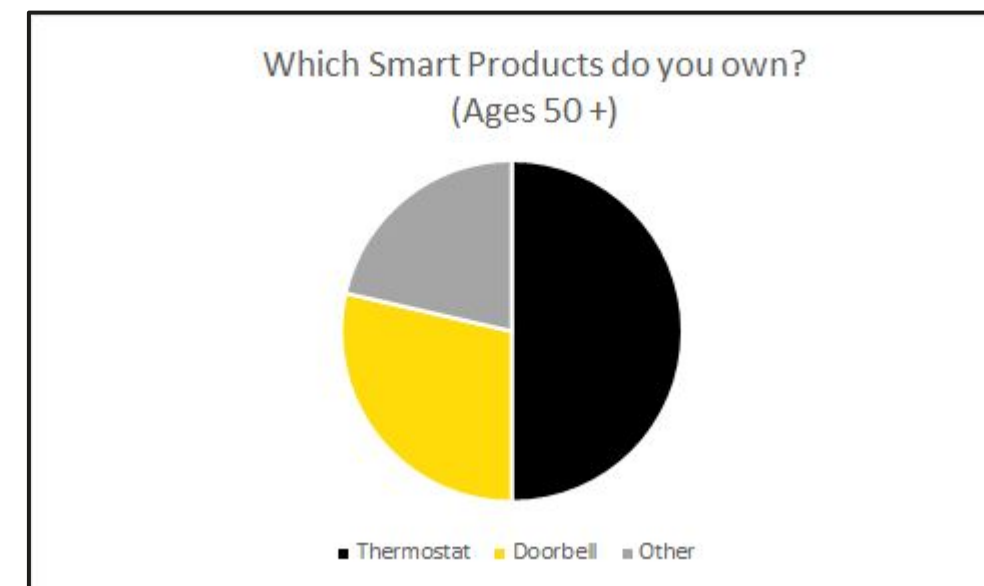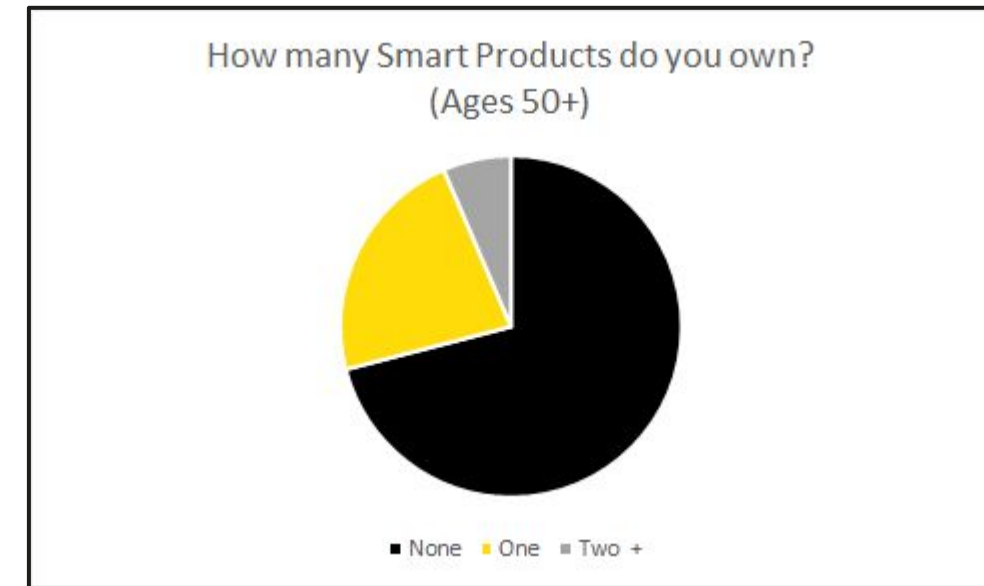
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Survey Insights

What did we learn?

Our class conducted a fairly informal survey about people's use of smart devices as a way to help us understand our target market. The main takeaways for our group were:

- Most people over the age of 50 do not own any smart devices.

- Of the people over 50 who do own smart devices, most own passive devices like a smart thermostat or doorbell, which require very little user manipulation once installed. Only those who had more than one smart device had a smart device that was more active, such as a smart home assistant.

Our design insight from this was that Baby Boomers who will be moving into Assisted Living Facilities in the future are not necessarily enthusiastic about actively using smart products. We took this into consideration in our design, ensuring that the residents of the facilities only passively interact with the smart doors.

How many Smart Products do you own? (Ages 50+)
■ None ■ One ■ Two +

Which Smart Products do you own? (Ages 50 +)
■ Thermostat ■ Doorbell ■ Other

Architectural Analysis

1

2

3

4

What is it like in an Assisted Living Facility?

1. Often, assisted living facilities have a car port to facilitate easy visits and excursions from the building. Sliding glass doors commonly serve as the main entrance.

2. In Some cases, we see a double-set of doors, other times there is only one. There may be a front desk on the inside of the front entrance

3. Assisted living facilities often have hallways of doors that look exactly the same. This can be confusing to people with dementia, who have a difficult time finding their own apartments. One way facilities mitigate this is by having cases of personalized memorabilia by the doors to help with recognition.

4. Another way that rooms are identified is through plaques with names and pictures located next to the door of each individual apartment.

Our design insight from this was that while the general structure of Assisted Living facilities is sound, there are some problems that residents face day-to-day that may be able to be alleviated through technology. Wayfinding regarding individual apartments and monitoring of the main entrance are prime targets for intervention.
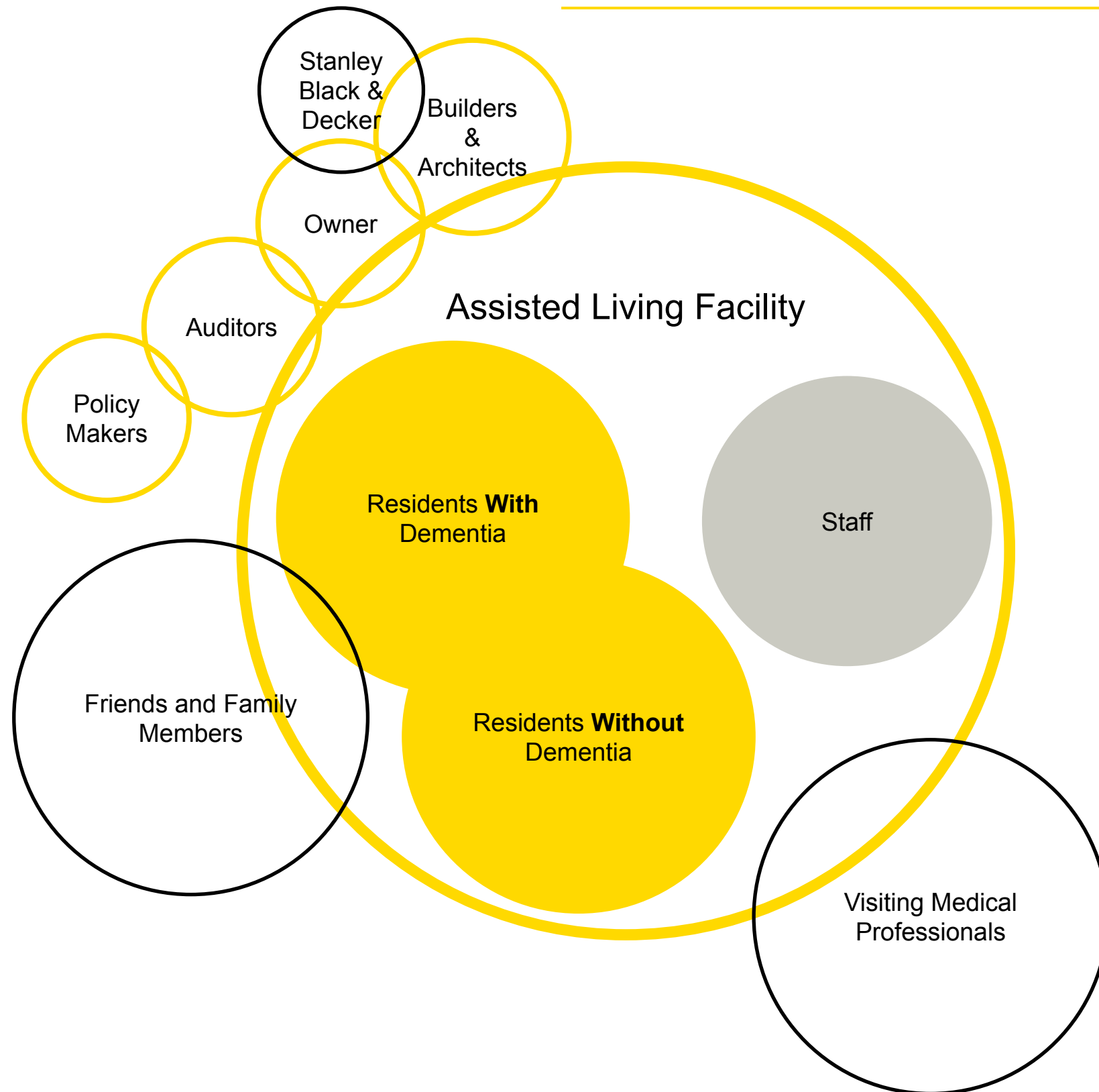
Business Insights

Our design insight from this was that while Stanley historically has focused on hardware, there is space for them to incorporate software/IoT into their business model. This could allow them to implement recurring monthly payments for data management, which provides a steady stream of revenue.

In order to move into smart products, Stanley will have to invest in R&D; something they are already doing through their Digital Accelerator.

Key Partners	**Key Activities**	**Value Propositions**	**Customer Relationships**	**Customer Segments**
• Assisted Living Facilities • Installation and maintenance technicians • Materials Suppliers • Tech Suppliers • Data Management Companies • US Government Regulators • Residents of Facilities • Staff • Families of Residents • Stanley service and support	• Entrance and Exit • Wayfinding • Communication • Safety (both discouraging wandering and fire safety) **Key Resources** • IoT • Knowledge of Doors • Maintenance techs • Relationships with builders/retrofitters	• Could mean less human attention on doors/less need to parse entrance and exit • Peace of mind for families • No need for use of hands to enter and exit—difficult for staff who are carrying things or helping someone with mobility challenges • Good selling-point for facilities	• Need to ensure that it is easy to use, no down-time • Ability to manage very technical IoT solutions with users who are not tech-savvy • Minimize privacy concerns **Channels** • Builders • Facilities management companies • Admin of Assisted Living Facilities	• Assisted living facilities, but similar could be used in offices, day care centers, etc.

Cost Structure	**Revenue Streams**
• Could be a subscription service for maintenance and IoT services • Currently mostly a product-based cost structure	• Data Management • Initial Product Sale • Maintenance

http://www.businessmodelgeneration.com

Stakeholder Map

Stanley Black & Decker

Builders & Architects

Owner

Auditors

Policy Makers

Assisted Living Facility

Residents **With** Dementia

Staff

Friends and Family Members

Residents **Without** Dementia

Visiting Medical Professionals
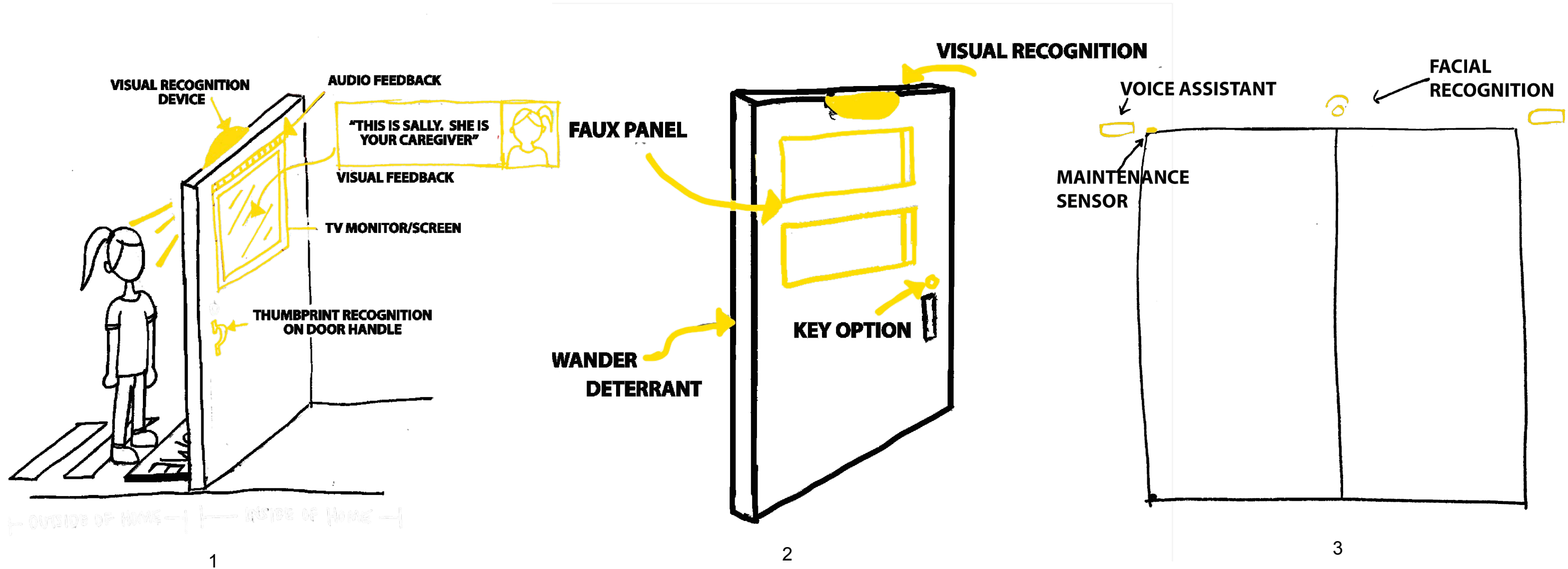
Who are we designing for?

Assisted Living Facilities have residents with varying levels of physical and mental ability. Some people who live in the facility may have 100% cognitive function, while others are in the early to mid-stages of dementia. It is important that any designs, fixtures, or fittings in an Assisted Living facility be appropriate for both of these groups.

Day-to-day, there is a group of staff that makes the Assisted Living facility run. They do administrative work, run the dining room, monitor the residents, and sometimes provide caregiving services. There are also visiting caregivers, therapists, and other medical professionals who may not be employed by the Assisted Living Facility but do visit often.

The friends and family members of the residents in these facilities come in and out for visits. They are also often the advocates for the residents, making sure they receive optimal care and a stimulating, supportive environment.

Assisted living facilities have regulations and requirements that govern their construction, and auditors who make sure they are up to code. The architect and owner often collaborate when deciding the specs for more expensive upgrades to the design; for example an IoT enabled door.
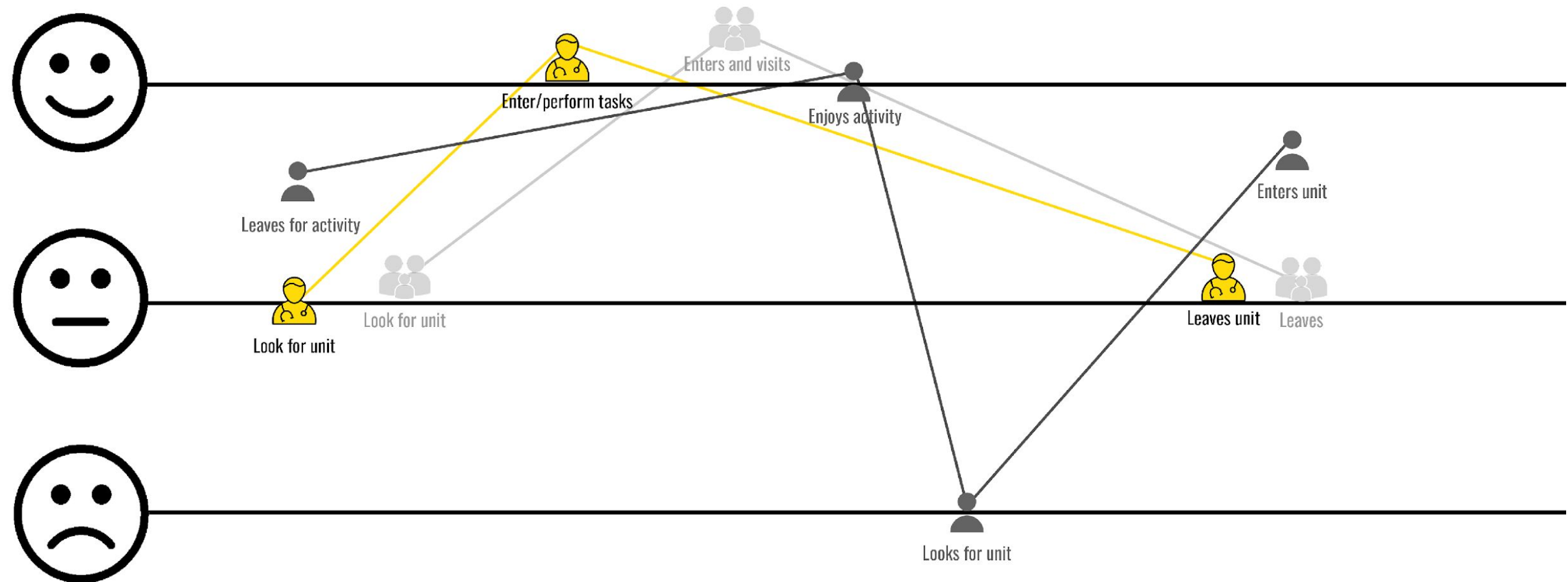
Initial Concepts

1

VISUAL RECOGNITION DEVICE

AUDIO FEEDBACK

"THIS IS SALLY. SHE IS YOUR CAREGIVER"

VISUAL FEEDBACK

TV MONITOR/SCREEN

THUMBPRINT RECOGNITION ON DOOR HANDLE

2

VISUAL RECOGNITION

FAUX PANEL

KEY OPTION

WANDER DETERRANT

3

VOICE ASSISTANT

FACIAL RECOGNITION

MAINTENANCE SENSOR

Initial Concepts

1. A door for someone with early to mid-stage dementia who live in their own homes. This door uses IoT to help identify visitors as well as provide peace-of-mind to caregivers.

2. A door for an individual room in an assisted living facility. IoT provides wander deterrence and helps caregivers access the space, while allowing the control and comfort of a traditional key.

3. A front door for an assisted living facility, focusing on controlling and logging both entrance and exit to the building. IoT can alleviate the pressure on staff to monitor the front door.

STAKEHOLDER JOURNEY MAP
CONCEPT 2 - DOOR TO ROOM (ASSISTED LIVING)

DEMENTIA PATIENT
STAFF MEMBER
FAMILY

Enter/perform tasks
Enters and visits
Enjoys activity
Enters unit
Leaves for activity
Look for unit
Look for unit
Leaves unit
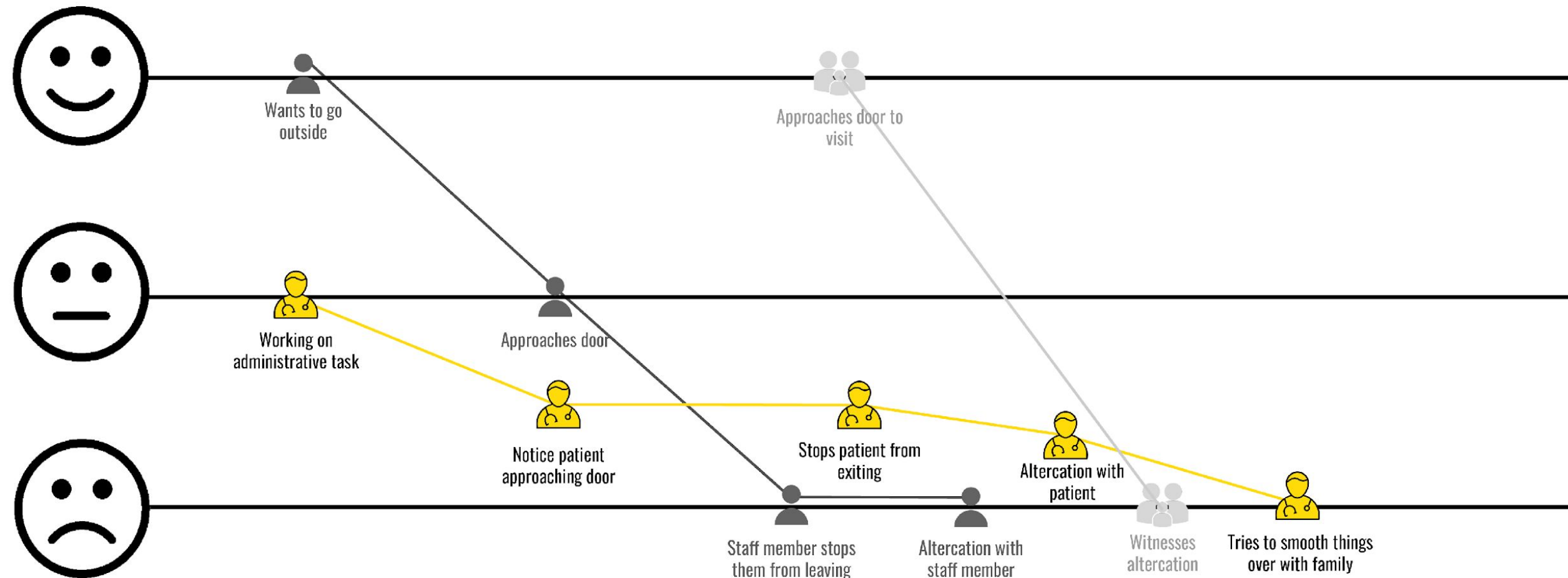Leaves
Looks for unit

BEFORE DURING AFTER

Design Insights

One of the main pain points for dementia patients/Assisted Living Facility residents is being unable to find the door to their personal room. Often, family and staff are not even aware of the difficulty the resident is experiencing, which means that they are not providing the support that may be needed in order to avoid frustration.

STAKEHOLDER JOURNEY MAP

CONCEPT 3 - DOOR TO MAIN ENTRANCE (ASSISTED LIVING)

Legend:
- DEMENTIA PATIENT
- STAFF MEMBER
- FAMILY

Journey points:
- Wants to go outside
- Approaches door to visit
- Working on administrative task
- Approaches door
- Notice patient approaching door
- Stops patient from exiting
- Altercation with patient
- Staff member stops them from leaving
- Altercation with staff member
- Witnesses altercation
- Tries to smooth things over with family

BEFORE > **DURING** > **AFTER**

Design Insights

The front door of an assisted living facility is a place that brings both stress and excitement to the stakeholders of an assisted living facility. While the front door is a portal to a world of activities and visits from family and friends, it is also an outlet to the outside world, which can be dangerous to people who are experiencing dementia. People with dementia often have difficulty moderating their mood, and conflicts with staff can happen when a resident wants to leave the facility and staff stops them. It can also be dangerous if staff does not notice that a resident is going outside without supervision.

Design Refinement
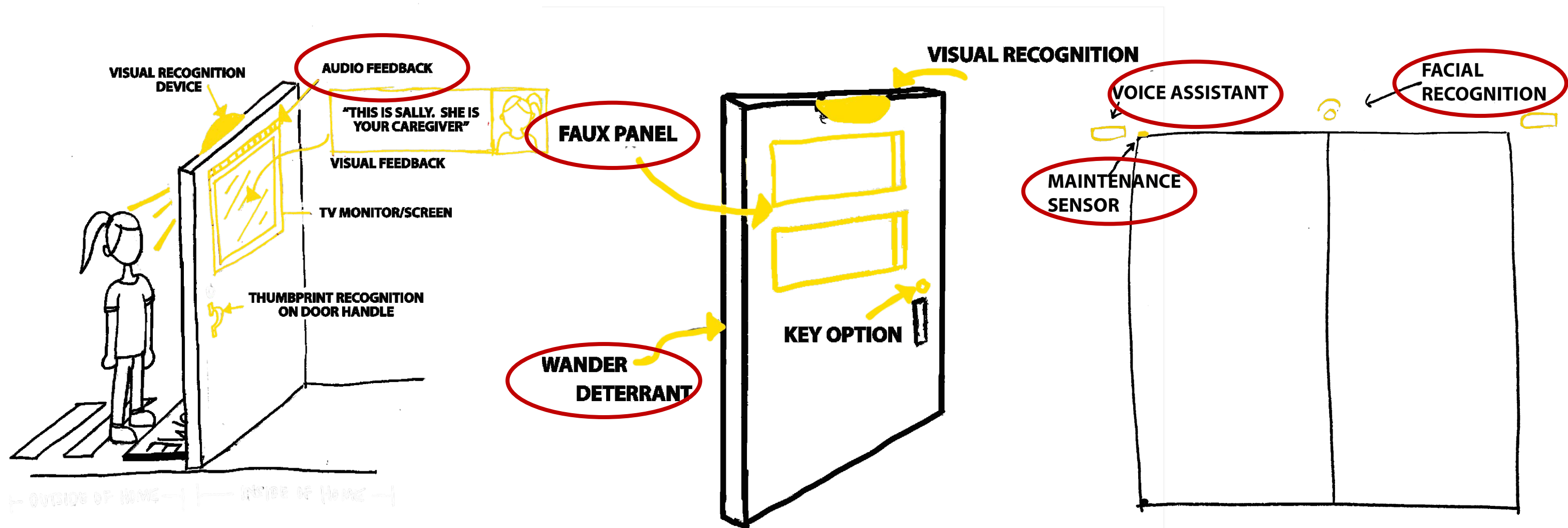
Concept Refinement

During our concept refinement process, we chose to move forward with a cohesive door system for Assisted Living Facilities. We integrated aspects of each of the initial concepts into a system that addresses the needs of various stakeholders including residents, staff, and visitors. While an individual residential home was part of one of our initial concepts, due to our research, we decided to focus on Assisted Living Facilities where the smart technology could be managed by someone other than the resident.

Storyboard–Resident and Staff
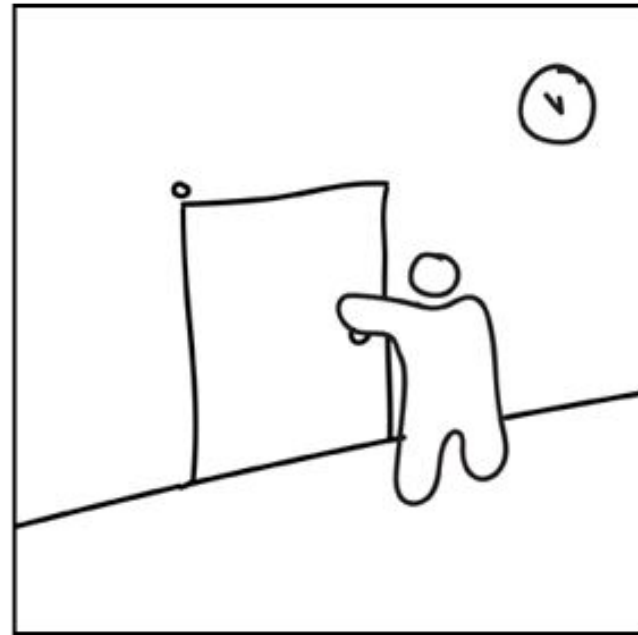
Late at night, Sarah leaves her room.
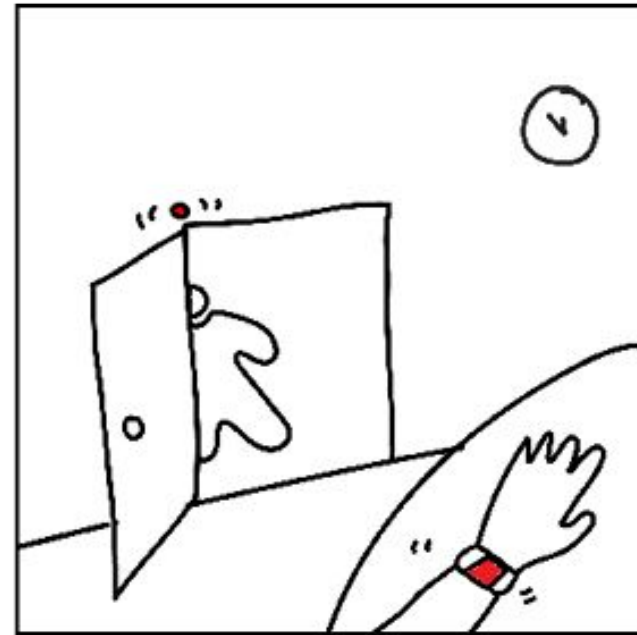
As she opens the door, a notification is sent to a device worn by a member of the Assisted Living Facility staff
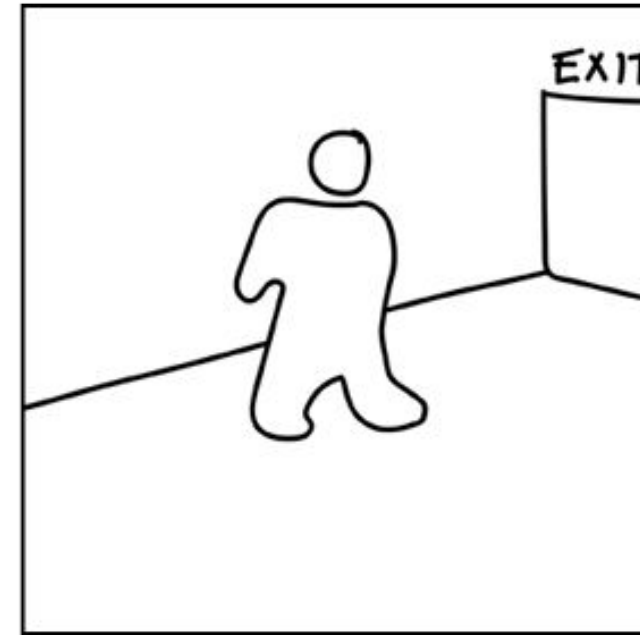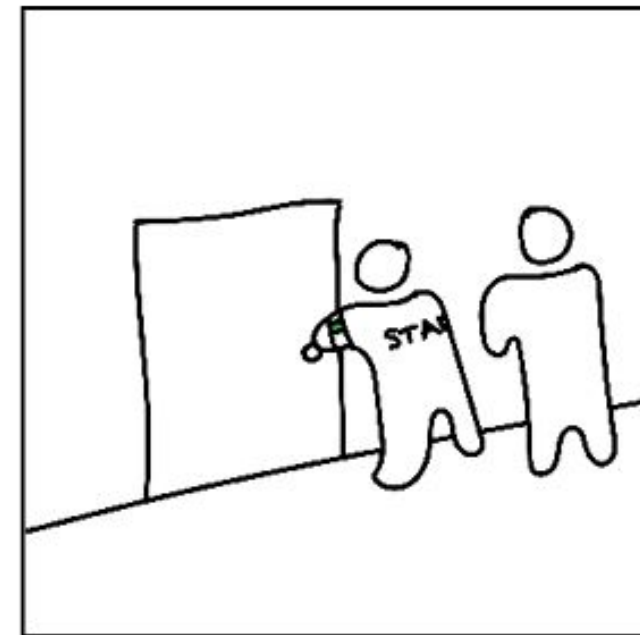
Sarah approaches the main exit before a staff member finds her
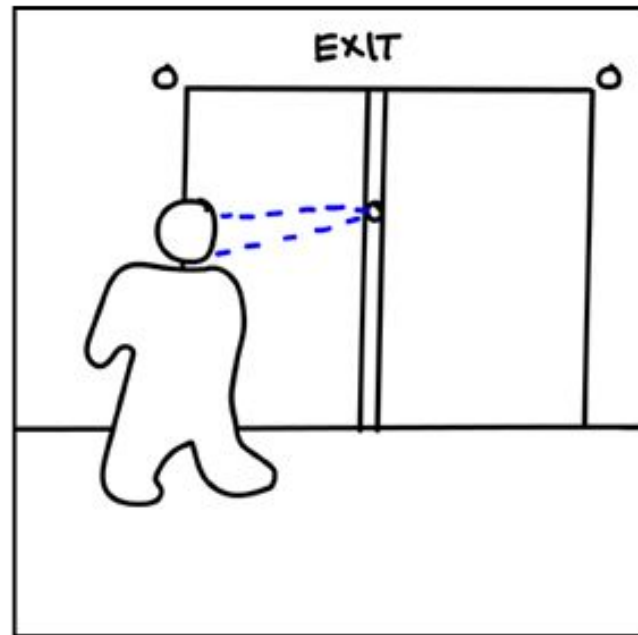
As she approaches, the door uses face-recognition technology to determine whether or not it is safe for Sarah to leave by herself
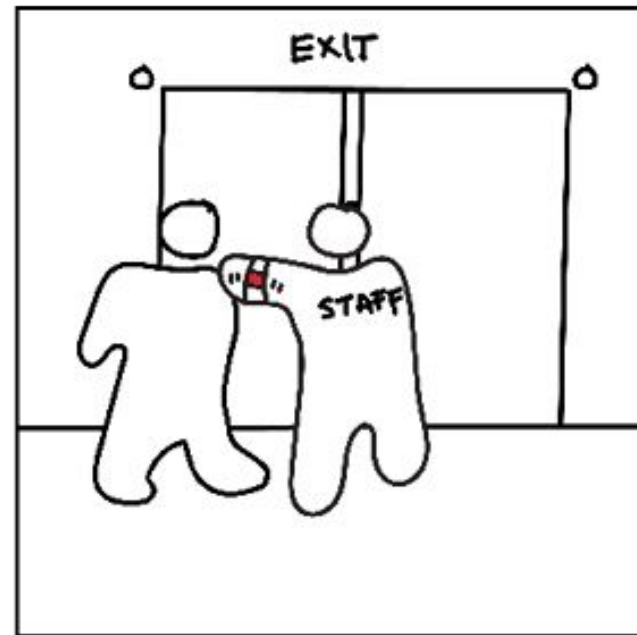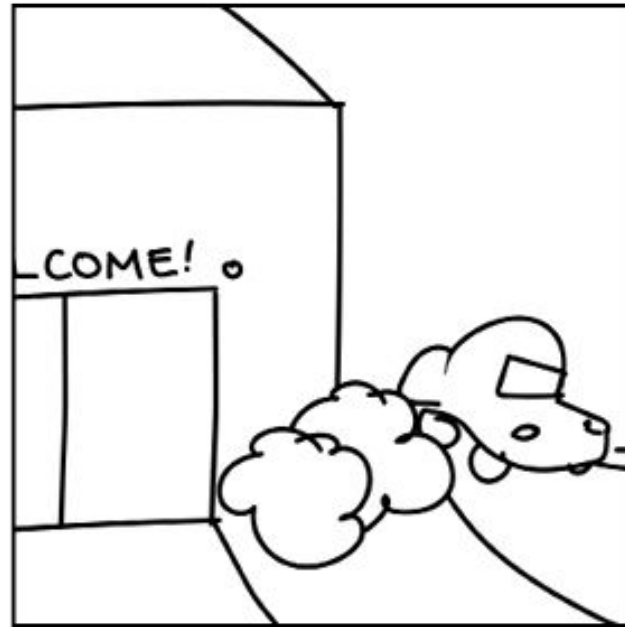
The front door sends another notification to the staff's wearable and does not open. Staff is able to find Sarah.
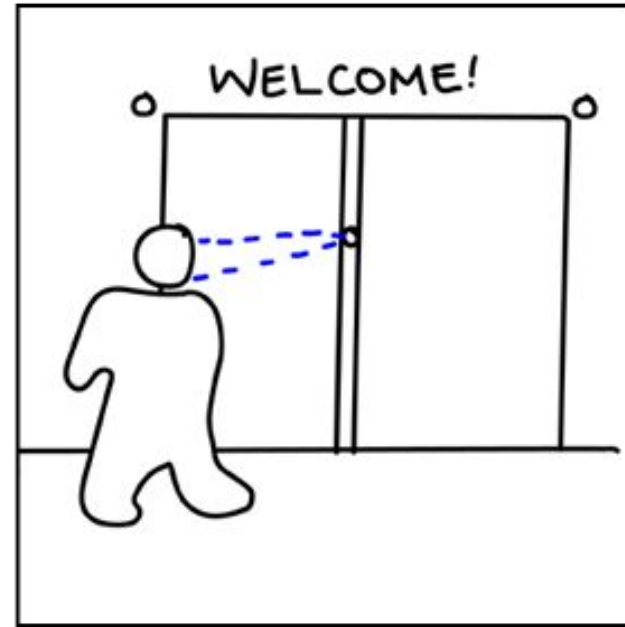
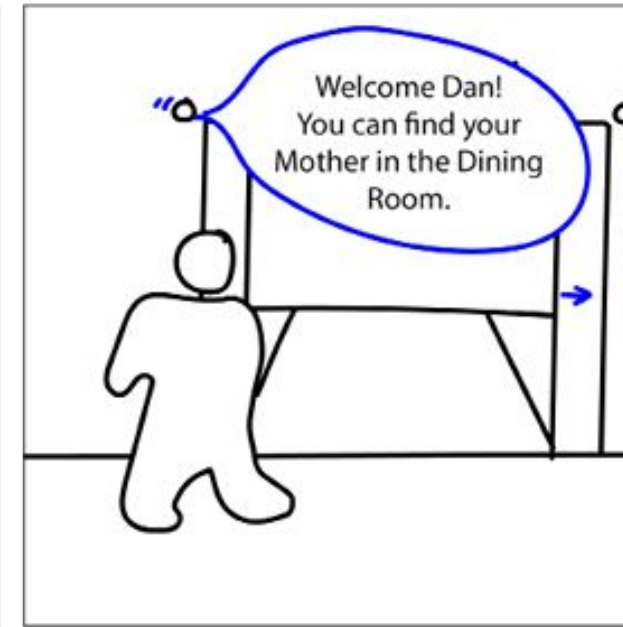Sarah is led back to her room so that she can get some rest.

Storyboard–Visitor

Dan arrives at the Assisted Living Facility to visit his Mother.

When he approaches the door, it scans his face and it identifies who he is by refrencing a database of family members
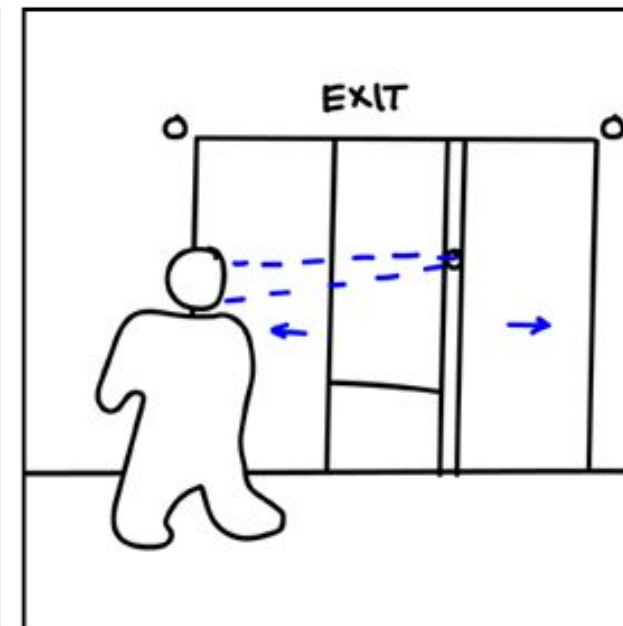
The door opens and greets Dan, letting him know where he can find his mother within the Assisted Living Facility.
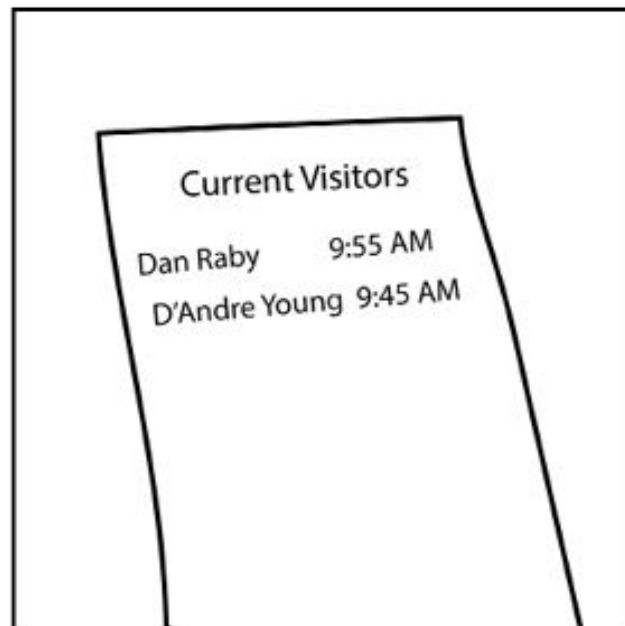
Dan's name, arrival time, and other pertinent information is logged and stored for reference
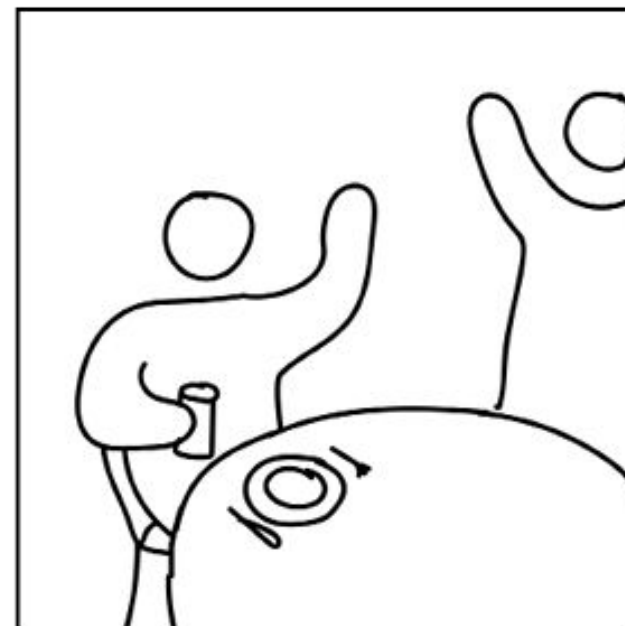
Dan is able to quickly locate his mother in the Dining Room

When Dan leaves, the door recognizes that he should be able to come and go as he pleases, and opens to let him out.

Final Design

Final Concept

Our final concept is a system of doors for an Assisted Living Facility that includes a front door to the facility along with doors to individual rooms. The front door uses facial recognition technology to moderate the flow of people entering and exiting the building, while also helping visitors find the people they are trying to visit and notifying staff if residents who need supervision are trying to leave. The door to each room notifies staff of late-night resident wandering and includes a veneer that looks like the resident's previous front door in order to empower them to find their rooms without assistance.

Outcomes

Benefits to Stanley Black & Decker

- Recurring Monthly Revenue from IoT/data management

- Cost reduction due to preventative maintenance

- Opportunity to expand similar technology to other markets such as office buildings

Benefits to Assisted Living Stakeholders

- Residents are empowered to wayfind without assistance, and safety is increased

- Staff can focus on tasks at hand and know they will be notified of unsafe resident wandering

- Families have peace of mind that their loved ones are safe and can easily navigate the Assisted Living Facility when visiting