

## **Project Title**

Smart Geo-Fencing System (SGS) for Residents' Safety

## **Project Lead and Members**

Project lead: Ms Teo Lay Hong, Executive Director

Project members:

- Tang Sze Chia, Manager, Ren Ci Hospital
- Moh Moh Hlaing, Resident Care Associate Lead, Ren Ci Hospital
- Sito Jowyn, Executive, Ren Ci Hospital

## **Organisation(s) Involved**

Ren Ci Hospital

## **Healthcare Family Group(s) Involved in this Project**

Healthcare Administration

## **Applicable Specialty or Discipline**

Resident Care Associate

## **Project Period**

Start date: Jan 2020

Completed date: On-going

## **Aims**

To adopt a RFID technology in helping care staff to promptly locate residents and bring them back to the household safely

## **Background**

See poster appended/ below

## **Methods**

See poster appended/ below

## **Results**

See poster appended/ below

## **Lessons Learnt**

Seeing how SGS has helped to improve staff productivity and enhance safety and care of our residents, has definitely inspired us to want to adopt more emerging technologies.

Ren Ci has always strived to be a forerunner in adopting emerging technologies to improve the workforce & care within the Community care sector. We believe that technology would not only help to alleviate the stress brought about by the manpower crunch within the community care sector but also level up the overall care of the sector.

## **Conclusion**

Ren Ci has scaled up this geofencing solution to other Ren Ci facilities – our other nursing home at Bukit Batok St. 52 and our senior care centres. Besides resident movement tracking, AMKNH has also started to adopt SGS to support attendance taking at our Senior Care Centre (SCC), thereby, reducing the burden of manual attendance taking of the clients. This is done through scanning of the clients' centre identification cards when they walk past RFID readers. Attendance taking is digitised and is efficiently recorded in the system. Staff are able to export the data in editable file formats to compute attendance for monthly billing of SCC charges. In addition, SGS could also be used for asset tracking so that it is more efficient to locate any shared medical equipment when they are transferred between the different levels in the facility.

## **Additional Information**

2022 National HIP – Excellence Champion Medal

**Project Category**

Technology

Digital Health, Tele-Monitoring, Sensors, Infra-red

Care & Process Redesign

Value Based Care, Safe Care

Care Continuum

Intermediate and Long Term Care & Community Care, Nursing Home

**Keywords**

Smart Geofencing System, Radio-Frequency Identification, Residents with Dementia

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# Smart Geo-Fencing System (SGS) for Residents' Safety

## INTRODUCTION

### Background

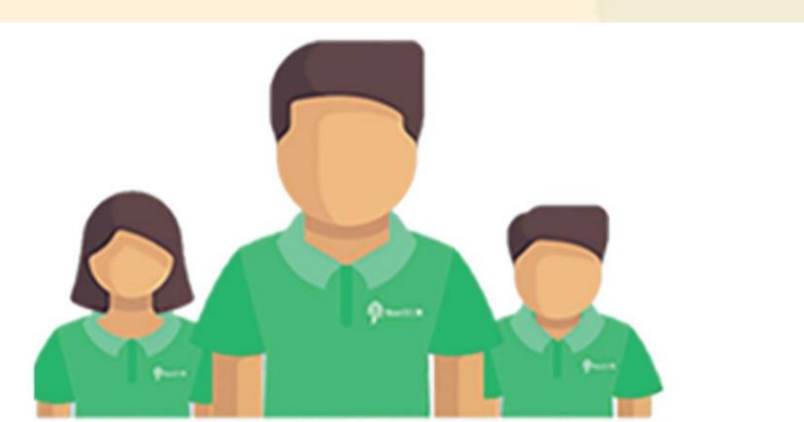
- Ren Ci encourages our Nursing Home residents (especially those ambulant & abled) to move freely within designated areas without being restrained to their beds/seats, confined to their household (i.e. living areas) or have their every movement closely monitored by staff.
- However, some residents (e.g. with dementia) have the tendency to **abscond or wander out of their households or facility unknowingly**.
- To keep these residents safe, the team adopted **Smart Geofencing System (SGS)** which uses RFID technology to track & record movements.

### Challenges faced in locating residents



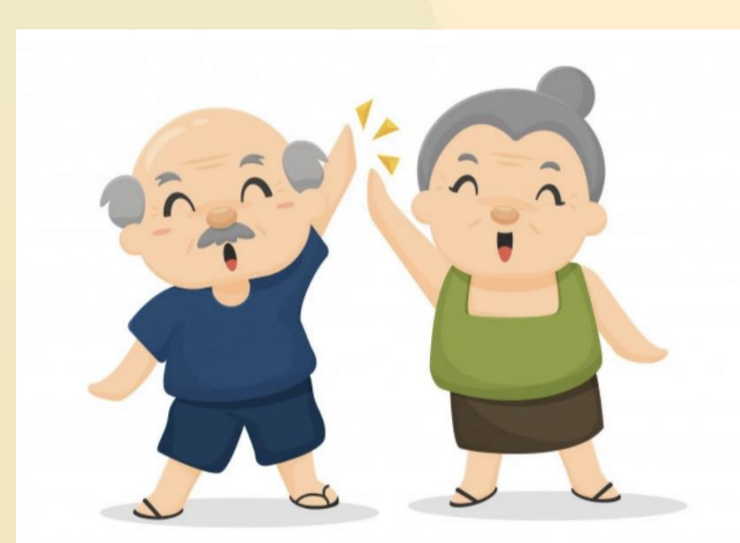
#### Sizeable Nursing Home

- One of the largest NH (11 floors)
- 28 Households (i.e. living areas), 472 Residents



#### Lean Manpower

- High Workload
- Exacerbated by COVID-19



#### Home-like Environment

- Home clothes
- Non uniformed clothing

**Solution:** Smart Geofencing System has helped care staff to promptly locate these residents and bring them back to the household safely.

## IMPLEMENTATION

Period	Phase
January – December 2020	<b>Pilot (3 Levels)</b> <ul style="list-style-type: none"> <li>• Design of overall system based on objectives</li> <li>• Identify the how, where, what:                             <ul style="list-style-type: none"> <li>- Best location of readers, panels, cable points</li> <li>- Type of tags etc.</li> </ul> </li> </ul>
From January 2021	<b>Implementation (all 8 Levels)</b> <ul style="list-style-type: none"> <li>• Deploy hardware and software</li> <li>• Training of staff on system</li> </ul>
On-Going	<b>Post-Implementation</b> Constant review to improve and enhance the solution

### Components



Small and water proof **RFID tag/s** sewn into the seams of residents' clothes



RFID reader at the lift lobby (e.g. non-permitted area)

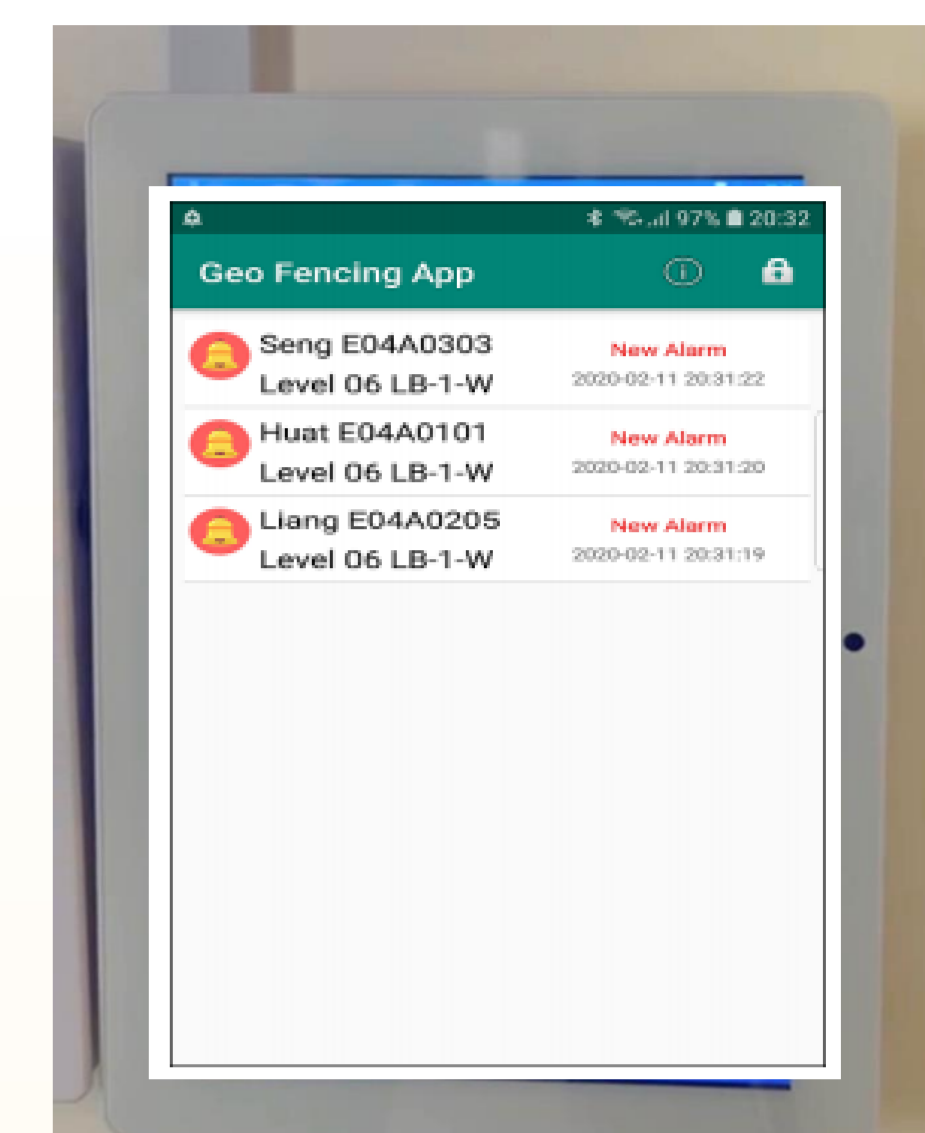


**Wireless tablet** at households and security post for staff to monitor movements.

### How it works?



Resident moves past a RFID reader at non-permitted area (e.g. lift lobby)



System triggers household gateway alarm to care staff and security officers at households and security post

Tablet would produce an alarm and show the last detected location of resident.



Staff & security able to promptly locate residents & bring them back to the household safely

## RESULTS

### Value for Staff

#### Manpower Optimization

- No need for staff to physically follow wandering residents around
- Time saved on locating resident is reduced from 2hours to only 10 mins

#### Enhanced Safety & Monitoring

- Ensure resident safety especially when care staff is occupied with other residents or during crowded visitor periods etc.
- Focus on more critical care work for residents with higher care needs

#### Automation & Records

- Reduce the need for manual records of residents' movement
- Recorded data is easily accessible and downloaded for use (e.g. study of residents' movement and preference)

### Value for Residents

#### Better Cognitive Health

- For ambulant residents, they can visit friends at other household levels, interact with friends at coffee corners as well as exercise in the garden and landscaping areas within the NH

#### Better Peace of Mind

- Multiple positive feedback from family members who are heartened to know their loved ones despite living in a NH, are able to continue to move around and interact with others

## EXTENT OF SCALE-UP

1) Scaled up this solution to other Ren Ci facilities (i.e. our other nursing home at Bukit Batok St.52 and our senior care centres).

2) Smart Attendance System:

RFID readers to scan and record attendance:

- Clients at Senior Care Centre (already adopted)
- Residents participating in household and volunteer activities

3) Assets Tracking System

- Tracking location of shared assets in the NH