

Project Title

Autonomous Mobile Robots (AMR) in Ren Ci @ Ang Mo Kio (AMKNH)

Project Lead and Members

Project lead: Doris Tan

Project members: Christine Ong, Park Jiwon

Organisation(s) Involved

Ren Ci

Healthcare Family Group(s) Involved in this Project

Ancillary Care, Healthcare Administration

Applicable Specialty or Discipline

Healthcare Administrators

Project Period

Start date: October 2021

Completed date: June 2023

Aims

The project aims to optimise manpower and improve workplace health and safety through the use of autonomous mobile robots. This would allow care staff to focus on their core functions in providing care needs and engage in meaningful activities with residents.

Background

AMKNH was one of the first few nursing homes to co-pilot the use of AMR with AIC and MOHH.

Methods

See poster appended/below

Results

Productivity Gains

It allowed care staff to focus on providing care to residents and engaging residents in meaningful activities.

Improved Workplace Safety and Health

The AMR took over the strenuous load-bearing tasks of transferring heavy food warmers and linen/consumables trolleys ranging between 120 kg/level and 200 kg/level.

Conclusion

- The team learnt that communication and constant review of work processes were crucial.
- Close communication between the project team and the vendor was necessary to align understanding and expectations in order to bring the project to a successful close.
- Constant review of work processes and how AMR would interface with them were necessary as the project team gained better understanding of the AMR's abilities and limitations.
- This has helped the team optimize the efficiency of the AMR in performing its tasks and ensure sustainability, thus alleviating the need for staff to carry out manual transfers.

Project Category

Care & Process Redesign

Operational management, Resource allocation, Quality Improvement, Workflow redesign,

Technology

Assistive technology, Mechanical equipment, Digitalisation, Automation, Robotics/Autonomous systems

Keywords

Workforce productivity, Mobile robots, Optimise manpower

Name and Email of Project Contact Person(s)

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Autonomous Mobile Robots (AMR) in Ren Ci @ Ang Mo Kio (AMKNH)

Team Leader

Doris Tan, Assistant Operations Manager

Team Members

Christine Ong, Operations Executive
Park Jiwon, Community Care Executive



Introduction

AMKNH was one of the first few nursing homes to co-pilot the use of AMR with AIC and MOHH.

Problem Statements

- Considerable man-hours is needed to perform routine, labour intensive tasks, due to AMKNH's infrastructural layout and size (472 beds)
- Situation exacerbated by manpower crunch and ageing workforce

Objective Statement

The project aims to optimise manpower and improve workplace health and safety through the use of autonomous mobile robots. This would allow care staff to focus on their core functions in providing care needs and engage in meaningful activities with residents.

Laundry



Dirty Laundry Collection



Clean Linen Delivery



Clean Clothing Delivery

Meals



Non-Halal Delivery (Kitchen)



Halal Delivery (Kitchen)



Non-Halal Delivery (Care Staff)



SCC Delivery (Kitchen)

Household Supply Delivery



Consumables Delivery



Diapers Delivery

Medical Supply Delivery



Medicine Delivery

Results

Productivity Gains

It allowed care staff to focus on providing care to residents and engaging residents in meaningful activities.



Increase in Delivery Productivity

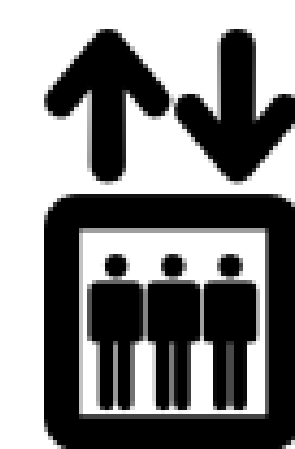
Medical Supply	Meals	Clean Linen	Dirty Linen	Household Supplies
↑30%	↑20%	↑15%	↑18%	↑4%

Improved Workplace Safety and Health

The AMR took over the strenuous load-bearing tasks of transferring heavy food warmers and linen/consumables trolleys ranging between 120 kg/level and 200 kg/level.



Problems Encountered



Lift Programming

- Lifts were not callable by the AMR
- Lifts were not able to travel to the required level for the AMR to perform its task
- Lift doors were not able to open/close on AMR command



Clash between AMR operations and other operations

- Lift used by AMR was also called by staff/visitors, thus disrupting AMR workflow



User Familiarity with AMR Operations

- Users did not understand or remember the AMR signal lights
- Users were not aware and continued to perform their tasks beyond the AMR's waiting time triggering the AMR's safety feature to cease operation
- Manual intervention by staff was required to enable AMR to resume operations

Conclusion

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Project Timeline

