Outbreak Preparedness: Leveraging on Autonomous Mobile Robots for last-mile deliveries

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Background

During the Covid-19 pandemic, strict visitor restrictions were imposed to isolate patients from their families. Visitors could drop off items for patients at the visitor experience service (VES) lobby, as a sign of support for the patients. VES colleagues will have these items delivered manually. This service was reduced to once per admission because the load was too large for the VES team to support.

The Proof of Value (POV) trial seeks to assess the value of leveraging on autonomous mobile robot (AMR) for last mile deliveries, both in terms of feasibility and manpower savings.

Methods
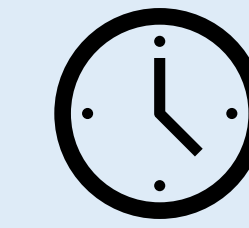
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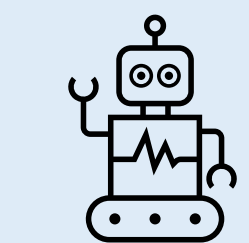
🤖 **Autonomous Mobile Robots**

☁️ **Integration via RoMi-H**

Implementation

A POV trial, supported by the Centre for Healthcare Assistive & Robotics Technology (CHART) and Tan Tock Seng Hospital's VES and Facilities team.

All brownfield infrastructure (card access doors, near sensor wave doors and lift) along the required route and the AMR were integrated via the Robotics Middleware for Healthcare (RoMi-H) facilitating interoperability and enabling the AMR to traverse both horizontally and vertically seamlessly between locations.
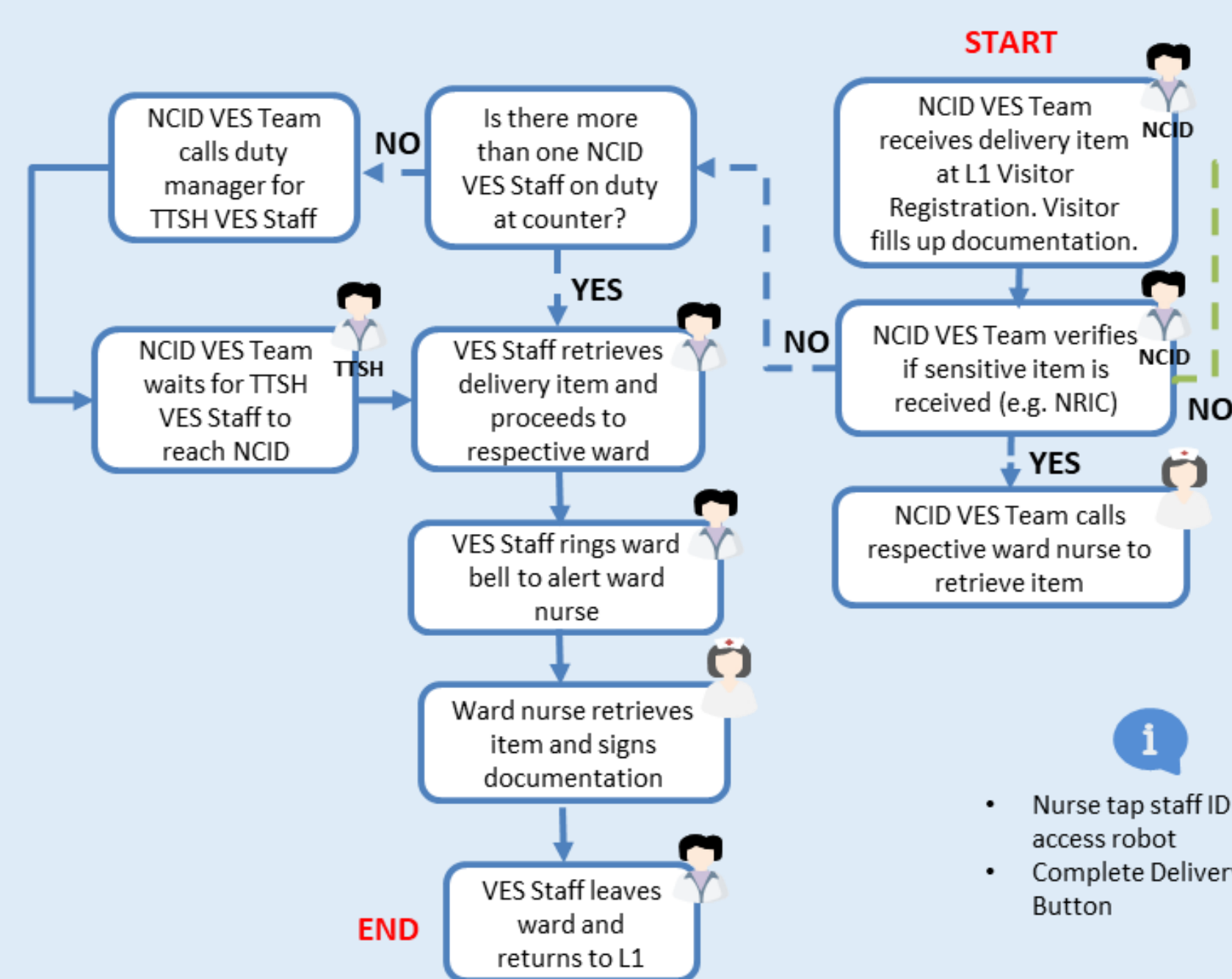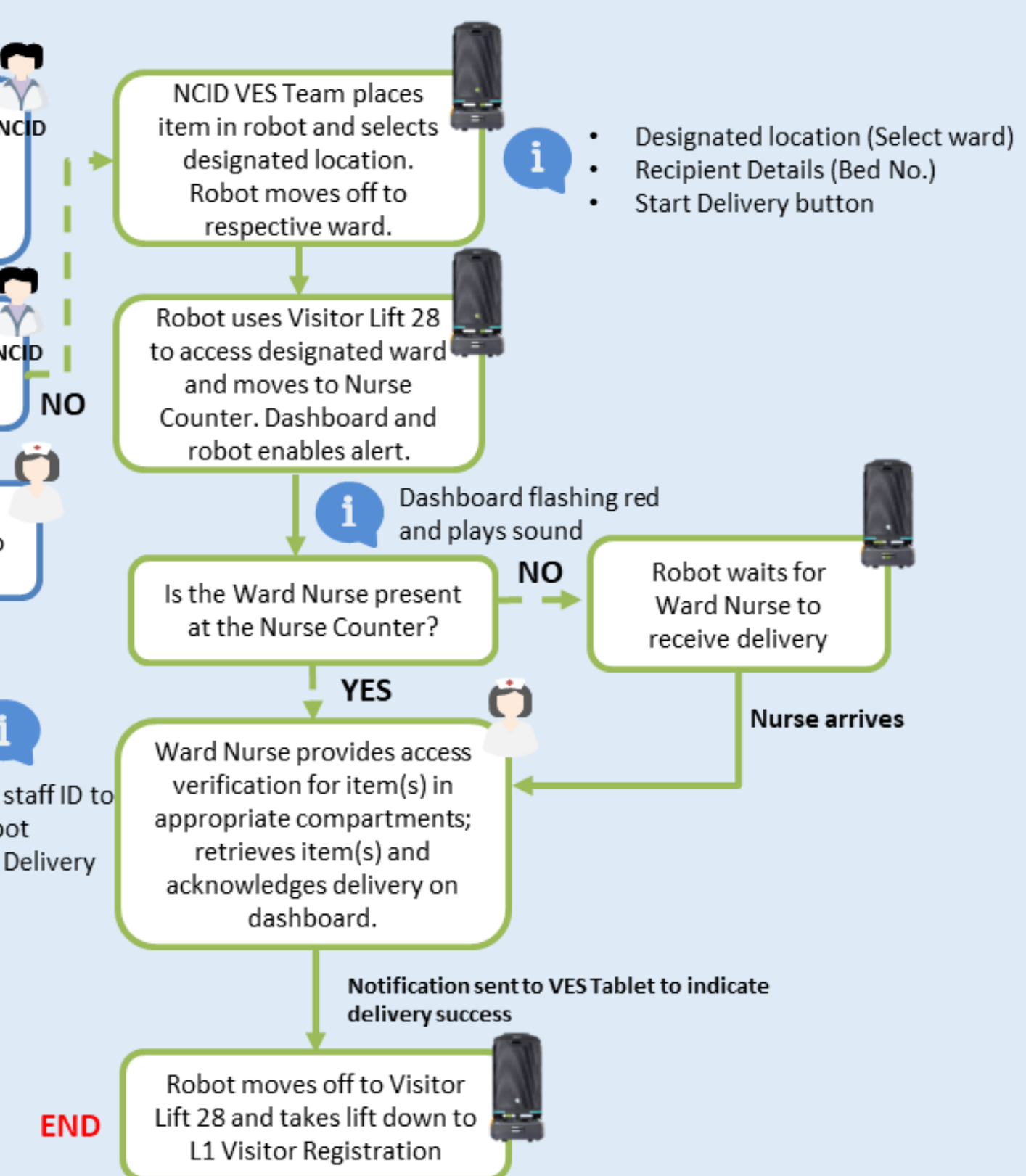
Results

With the AMR, deliveries of patient belongings and food items between NCID ward registration counters and inpatient wards have proven to be feasible and a positive experience. This demonstration also translates to a time savings of 3.5 hours per day[1]. Nursing and VES manpower could then be conserved to perform other core duties whilst attending to these additional requests by patients' next-of-kins, which aid in patient recovery.
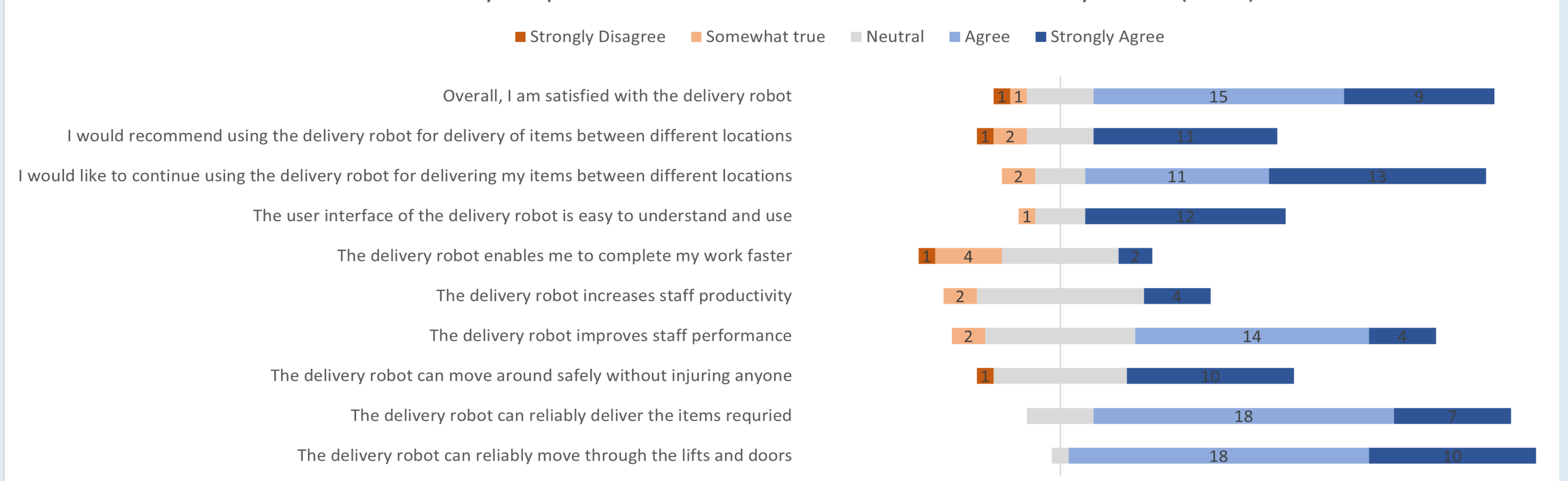

Up to 5.31 FTE savings (outbreak[2])

[1] Baseline data: 13 deliveries per day across 7 wards
[2] Estimated outbreak needs: 105 deliveries per day across 14 general wards

Survey Response of the VES Staff Satisfaction of Delivery Robot (n=30)

80% of staff were satisfied

Conclusion

NCID is the first trial site in Singapore with a full end-to-end integration of existing infrastructure with RoMi-H via commercial cloud and 4G/5G internet network.

The potential of a last mile delivery AMR is amplified during period of strict visitor restrictions. Minimising human intervention in non-direct patient care is beneficial to staff productivity, especially in times of strained resources.