Project Title

Implementation of Autonomous Robotics to Enhance Daily Manual Task

Project Lead and Members

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Organisation(s) Involved

Singapore General Hospital; ISS Facility Services Pte Ltd

Project Period

Start date: October 2019

Completed date: December 2019

Aims

To reduce the amount of time spent on daily manual floor at corridors and lift lobby areas, from 35 minutes to 15 minutes, within 2 months, while improving consistency in floor cleanliness.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

Staff need time to adapt and learn new skill. And require time to practice and get familiar with new technology.

Allow staff to have longer practice trial run and close monitoring along the way. Able to let them get familiar faster with the new technology.

Conclusion

See poster appended/ below

Project Category

Technology, Automation, IT & Robotics Innovation

Keywords

Technology, Automation, IT & Robotics Innovation, Robotics, Plan Do Study Act, Time Saving, Singapore General Hospital, ISS Facility Services Pte Ltd, Autonomous Scrubber Robot

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Implementation of Autonomous Robotics to enhance daily manual task

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care
education
research

Singapore General Hospital
SingHealth

Background of the problem

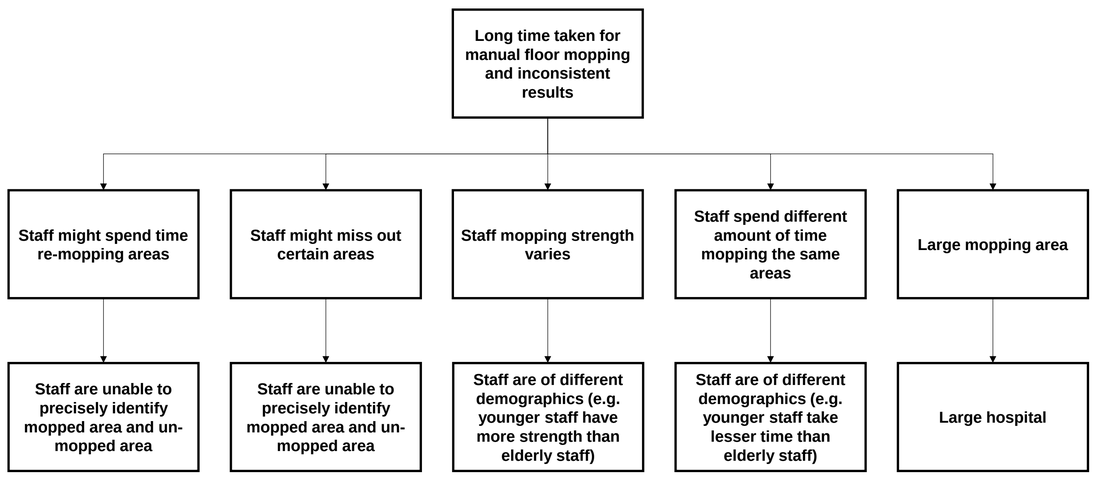
Station housekeepers are tasked to perform daily manual floor mopping at inpatient ward corridors and lift lobbies, as part of their daily tasks. The average time taken for manual mopping at the ward corridors and lift lobbies for each level are **20** and **15** minutes, respectively. Time taken to complete the tasks may vary across housekeepers (e.g. an elderly housekeeper may take a longer time as compared to a younger housekeeper). Cleaning results are also found to be inconsistent based on the individual housekeeper performance with varying human strength, and some areas might be missed out. Hence the housekeeping team decided to explore an autonomous solution to improve the manual floor mopping process.

Mission Statement (AIM)

To reduce the amount of time spent on daily manual floor at corridors and lift lobby areas, from 35 minutes to 15 minutes, within 2 months, while improving consistency in floor cleanliness.

Analysis of problem

The team observed that the current floor mopping is time consuming due to the large areas, and there are inconsistencies in the time spent and cleanliness based on housekeeper's performance. Housekeepers were unable to precisely identify mopped area and un-mopped area with varying human strength being applied when mopping the floor manually, that may lead to repetitive mopping of the same area or areas being missed out. These observations has been included in the 5-why diagram as below.



Interventions / Initiatives

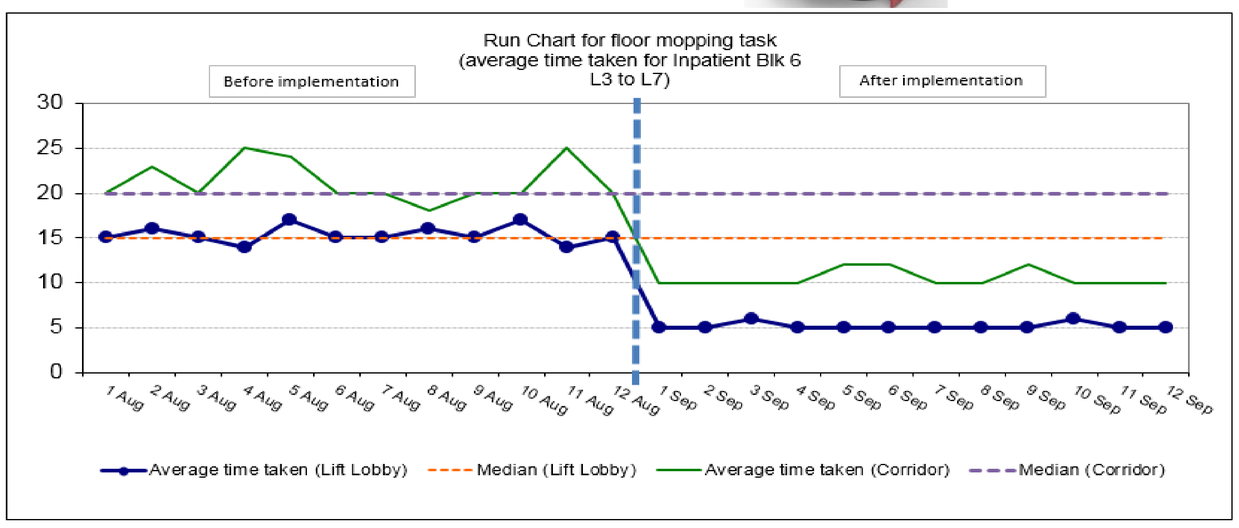
Due to the few root causes identified, the team decided to address all root causes with the implementation of an autonomous scrubber robot. The team used the PDSA method as below.

Plan	Do	Study	Act
• Site survey on the accessibility and mobility for autonomous scrubber robot • Viewing of demo to know the performance and ability of autonomous scrubber robot	• Mapping for autonomous scrubber robot at the selected area • Training provided to housekeepers on handling the robot	• Monitor floor cleaning result and gather feedback from users • Record time taken for further expanding deployment	• Deployment of autonomous scrubber robot at inpatient wards Block 4 to 6

Results

Tangible result – Time taken for floor mopping task is significantly reduced as shown in the run chart below. Time usage and cleanliness of the floor is more consistent.

Figure 1: Autonomous Robotic Scrubber



Intangible result – Positive feedback received from users at the wards area. (Wd 64 SNM Rathi, NC Lee Yan, Wd 63 SNM Yap)

Floor looks cleaner with the use of the autonomous scrubber robot!

The autonomous scrubber robot operates at an acceptable noise level

Positive feedback received from housekeepers at the wards area. (Ji Xiu Jie, Wang Na Na, Cheong Chui Yin, Liu Qing Fang)

Happier now as have more time at wards cleaning and also focus on other tasks

Sustainability Plans

The autonomous scrubber robot has greatly reduced the time used for manual floor mopping and greatly increased the productivity for housekeepers. Planned to acquire more units to expand the usage area to replace more manual task and achieve more man hours save. We keep innovating new technology and product to advance our housekeepers performance and hospital cleanliness. On-going testing of fully automated for autonomous scrubber robot at smart ward 45A. SGH will be the first and only hospital in Singapore with this technology on total unmanned machine that is able to enter door, discharge and load cleaning chemical by itself.

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