Project Title

ALPS-SGH MMD Automated Storage and Retrieval System (ASRS) & Pick To Light System (PTL)

Project Lead and Members

Rosli Bin Boedjang

Organisation(s) Involved

ALPS Pte Ltd, Singapore General Hospital

Healthcare Family Group Involved in this Project

Healthcare Administration

Specialty or Discipline

Materials Management Department

Project Period

Start date: 2019

Completed date: 2021

Aims

1. To improve order picking turn-around time by introducing picking automation
2. To increase picking efficiency by enhancing the efficient flow of materials with the optimised use of limited storage space through increased warehouse space utilisation and area segregation for various logistic activities
3. To improve supplies picking accuracy by segregating the picking activities to small picks, medium picks and bulk picks

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Lessons Learnt

See poster appended / below

Conclusion

See poster appended / below

Additional Information

Singapore Healthcare Management (SHM) Conference 2021 – Shortlisted Project (Supply Chain Management Category)

Project Category

Care & Process Redesign, Quality Improvement, Job Effectiveness, Value Based Care, Operational Management, Logistics Management, Supply Chain, Inventory Management, Build Environment, Space Planning, Inventory Space Management

Keywords

Warehouse Storage Space, Bulk Picking Store, Bulk Storage Store

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ALPS-SGH MMD Automated Storage and Retrieval System (ASRS) & Pick To Light System (PTL)

Rosli Bin Boedjang

ALPS Non-Pharma Logistics, SGH MMD

Singapore Healthcare Management 2021

A L P S
Synergies in Healthcare Supply Chain

Background

There are various supply chain functional teams in MMD. One of which is to pick supplies for replenishment to the wards, clinics, departments and labs. Supplies were manually picked in the warehouse by a group of supplies picking staff. These were supported by other teams in the warehouse for receiving of supplies and replenishment to the warehouse picking shelves. The logistic activities in the warehouse were manual and tedious. This often created challenges which led to a higher rate of picking errors. The limited space in the warehouse also created congestion and inefficiency in the warehouse logistics activities.
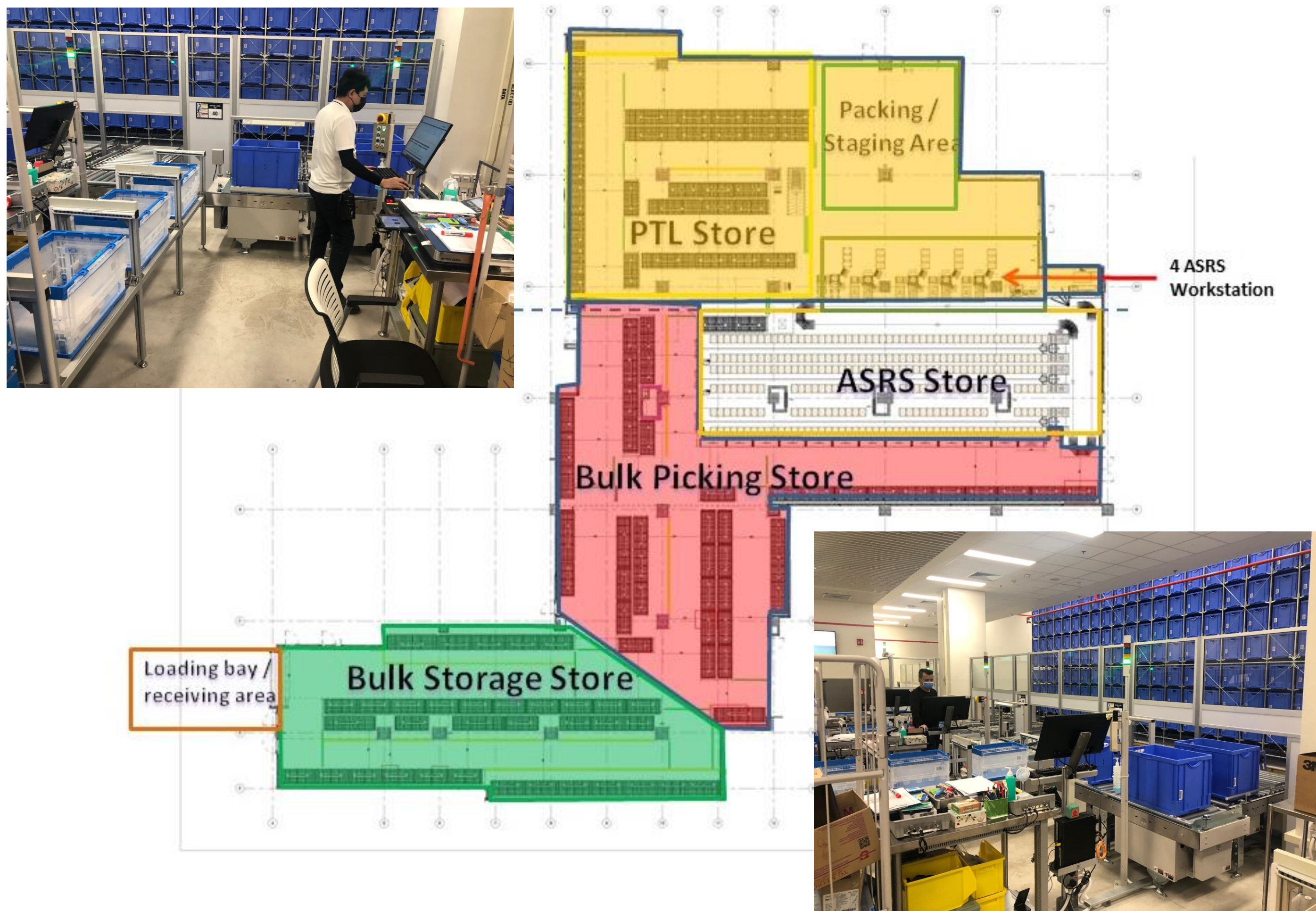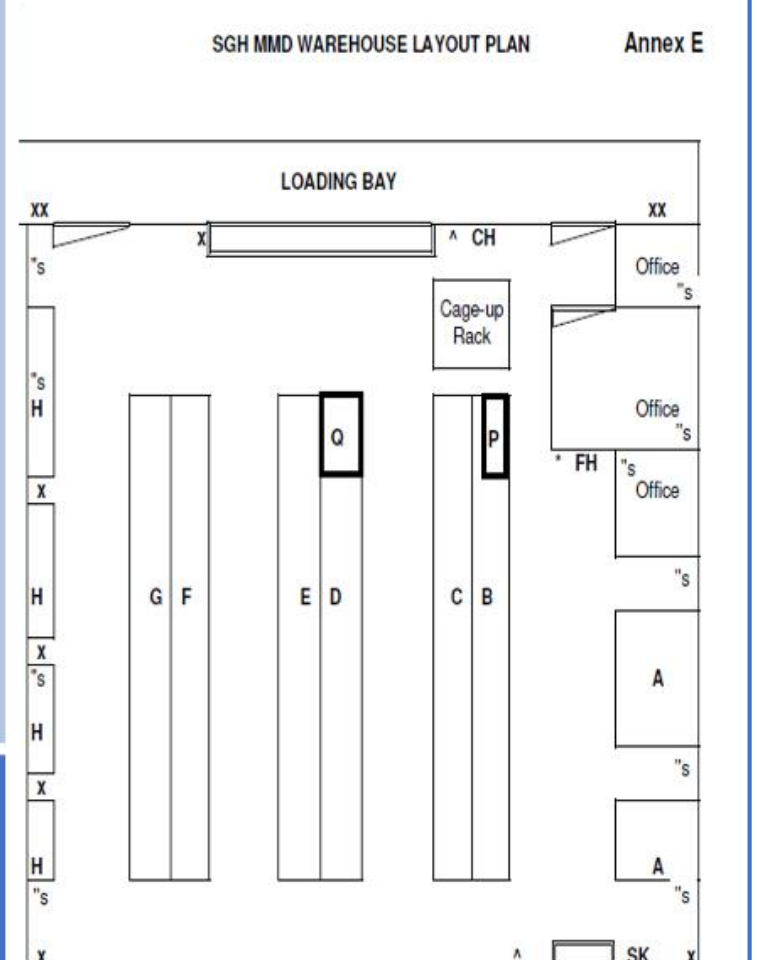
Objectives

➢ To improve **order picking turn-around time** by introducing picking automation.

➢ To increase **picking efficiency** by enhancing the efficient flow of materials with the optimised use of limited storage space through increased warehouse space utilisation and area segregation for various logistic activities.

➢ To improve supplies **picking accuracy** by segregating the picking activities to small picks, medium picks and bulk picks.

Methodology

The root cause analysis tool was used to identify the various root causes encountered in the logistics process

Method	Equipment	Environment
1. No consolidation process 2. No staging activity to check picking accuracy 3. Long order pick list 4. Longer wait-time for retrieval of items stored at higher level shelves by reachtruck	1. One reachtruck (forklift) 2. One pallet jack 3. Reachtruck downtime	1. Warm temperature 2. Humid 3. Poor Air Circulation 4. Too strong wall fan draft
1. Items not in standard packing 2. Manual counting required for picking quantity less than a box/packet. 3. Stocks not available for picking.	1. Limited storage space 2. Limited staging space for incoming delivery 3. Material flow not optimized 4. Sharing storage space with supplies picking location 5. No proper segregation of logistics activities in the warehouse	1. Poor attendance 2. Poor performance 3. Requires more breaks during work hours 4. Staff fatigue & physical exertion from continuous physical walking for picking
Material	**Space**	**People**

➢ Slow order picking turn-around time
➢ Poor picking efficiency
➢ oor picking accuracy

Results

The root cause analysis helped to identify the current issues. As the warehouse will be relocated to SingHealth Tower in 2021, MMD took the opportunity to optimize the planning of the warehouse layout and enhance the various logistics activities. In conjunction of providing sufficient warehouse storage capacity to support a 10-year SGH expansion plan, an automation system was designed in 2019 and finalized for execution in early 2020.

1. Optimal warehouse layout with 4 storage space segregation:
   - **ASRS Store** for small items rapid picking. 4 ASRS workstations for use as supplies picking / supplies replenishment. Batch picking optimization for 3 supplies store picking for the same wards. 60% of line items in ASRS store. **Results: Increase order picking turn around time.**
   - **PTL Store** for medium size / volume orders. Staff assigned with RFID ring to activate order picks and color panels will allow 4 different staff to concurrently pick supplies as per assigned color code on the warehouse shelves. 25% of line items in PTL store. **Results: Increase picking efficiency**
   - **Bulk Picking Store** (warehouse shelves) for bulk size / volume orders. Staff using iPad to confirm item location QR code and pick item QR code for picking verification. 15% of line items in Bulk Pick Store. **Results: Less items picking/ less walking**
   - **Bulk Storage Store** (warehouse shelves) are located near the receiving office and loading / unloading bay and further away from the other 3 stores. Storage space are available to manage incoming supplies on pallets. Supplies replenishment from Bulk Storage Store to the 3 supplies picking store. **Results: Less congestion**

2. Enhanced warehouse layout provided area segregation for supplies packing, supplies staging and return supplies area.

3. Better working condition & air circulation due to 24 x 7 air-conditioned environment.

Packing / Staging Area
PTL Store
4 ASRS Workstation
ASRS Store
Bulk Picking Store
Loading bay / receiving area
Bulk Storage Store

Conclusion

The ASRS has been designed for future expansion in terms of a 5th workstation and additional capacity of automated storage transporter vehicles. The integrated system allows the dynamic movement of line items between ASRS and PTL and between PTL and Bulk Picking store.

In preparing for future SGH Campus expansion plan, the ASRS and PTL system are designed and implemented to support the supplies requirement for the next 10-year plan with the automation capability and efficient use of warehouse storage space.