Project Title

Improvement of Warehouse Operational Efficiency Through Automation

Project Lead and Members

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Organisation(s) Involved

Singapore General Hospital, ALPS Pte Ltd

Healthcare Family Group Involved in this Project

Pharmacy, Healthcare Administration

Applicable Specialty or Discipline

Operations

Aims

To customise an automated system to improve operational efficiency, accuracy and productivity for optimal service delivery and to support future expansion.

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Conclusion

See poster appended / below

Additional Information

Singapore Healthcare Management (SHM) Conference 2021 – Merit Award (Supply Chain Management Category)

Project Category

Technology, Digital Health, Care & Process Redesign, Operational Management, Supply Chain, Productivity, Time Saving

Keywords

Automation System, Root Cause Analysis, Fish Bone Diagram, RFID, Pick Accuracy

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ALPS
Synergies in Healthcare Supply Chain

1. BACKGROUND

SGH Pharmacy warehouse holds approximately 1400 stock items. As a busy tertiary hospital, we face challenges such as (1) space constraint due to increasing volume of goods, (2) increased turnover over the years due to increase in demand and campus expansion, (3) inefficient and time consuming activities due to conventional manual logistics model, (4) increased movement of staff due to expanded warehouse and (5) pick inaccuracy during manual picking process. To tackle these issues, we decided to leverage on automation to improve on our operational efficiency.

2. MISSION STATEMENT

To customise an automated system to improve operational efficiency, accuracy and productivity for optimal service delivery and to support future expansion.

3. ANALYSIS

We reviewed the work processes and analyze issues that are not optimal at current stage. A root cause analysis using fish bone diagram was conducted and the results presented in figure 1 below.
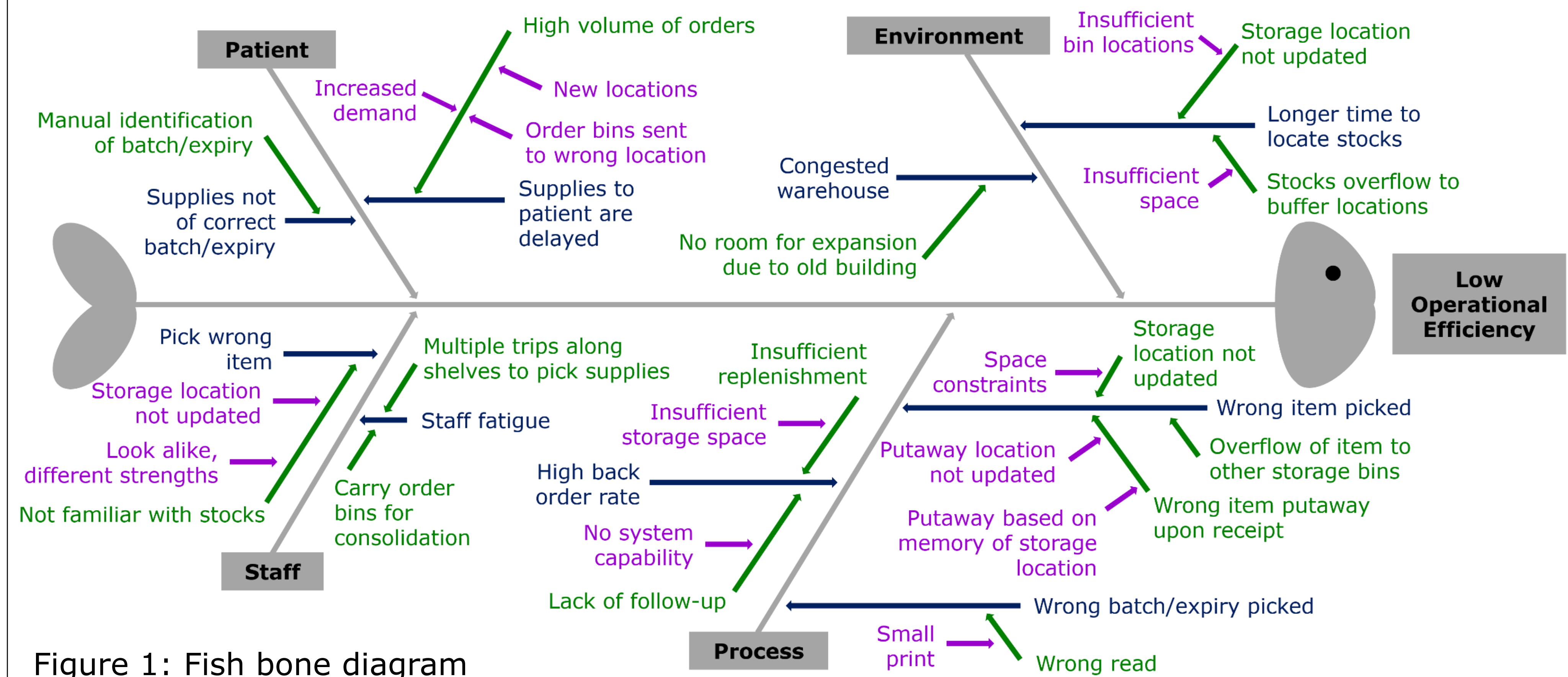

Figure 1: Fish bone diagram

4. INITIATIVES

Based on the root causes identified, we brainstormed and explored different options with stakeholders and vendors. The following initiatives were identified and carried out in table 1:
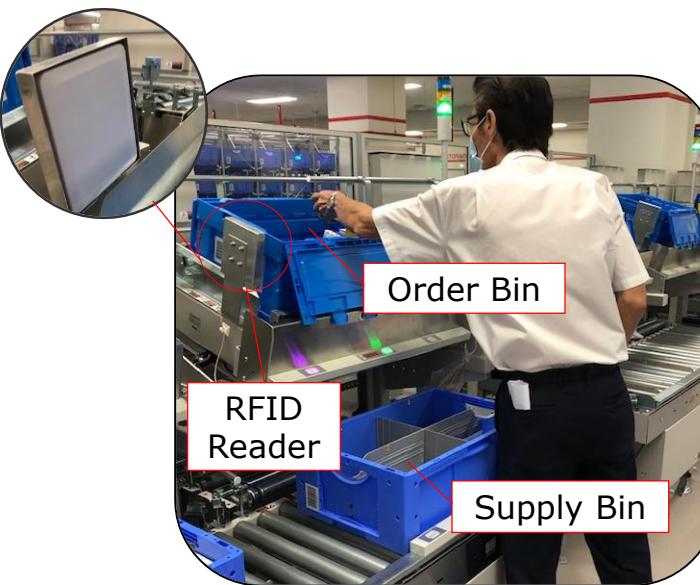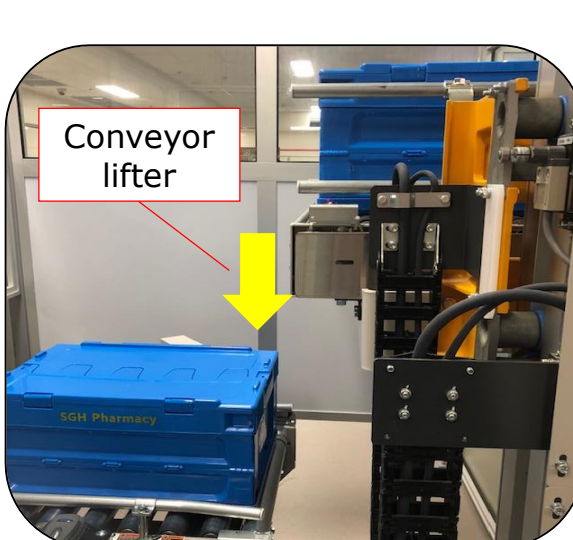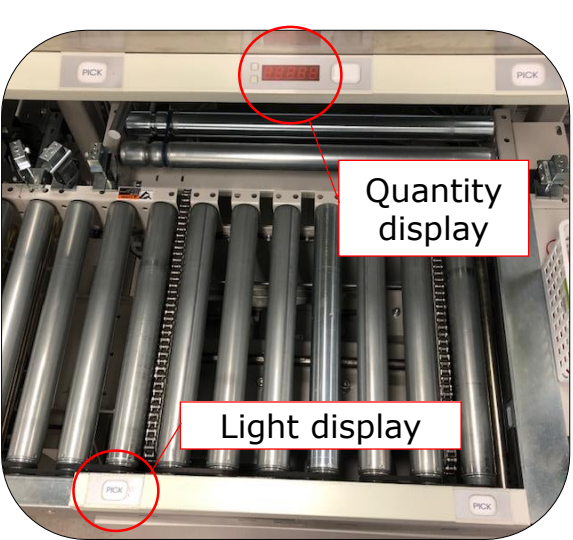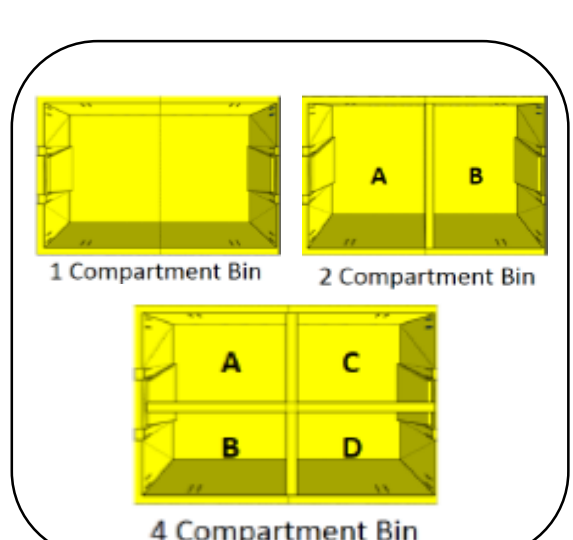
Initiatives	Ergonomic Design	Guided Pick Module, Scanning Capability	Increased Storage Space
Solutions	▪ Supply bins are transported to operation point for logistics activities ▪ RFID capability to identify order bins along conveyor system ▪ Order bin moves to consolidation lane via conveyor lifter when user confirms bin is full and ready for dispatched	▪ Supply bin compartment will light up to guide staff to correct bin location ▪ User prompted by display of pick quantity ▪ Scan Goods Received Note(GRN) to ensure correct item for putaway and picking ▪ System is configured to supply item based on First Expiry First Out format	▪ High density storage space to utilize new warehouse space with sunken pit to house Automated Storage and Retrieval System (ASRS) ▪ Supply bins are configured with 1, 2 and 4 compartments for low volume stocks
Problems Addressed	▪ Reduce movement of logistic staff in warehouse ▪ Reduce heavy loads lifting	▪ Accurate verification of picked item by guided pick module ▪ Confirmation of right batch/expiry through barcode scanning	▪ 1416 storage locations created in ASRS ▪ Increase storage locations for low volume stocks through division of supply bins

Table 1: New initiatives

5. RESULTS

We attained 88% of stock keeping units being placed in the automation system, 67% in ASRS and 21% in PTL. This was achieved by capturing the correct drug quantity per bin data before roll out.

It has led to faster fulfilment of supplies for logistics activities. We have likewise achieved 100% pick accuracy in items picked through barcode scanning.

There is a productivity gain of 10% post-implementation (figure 2). This increased workload was managed without manpower increase.
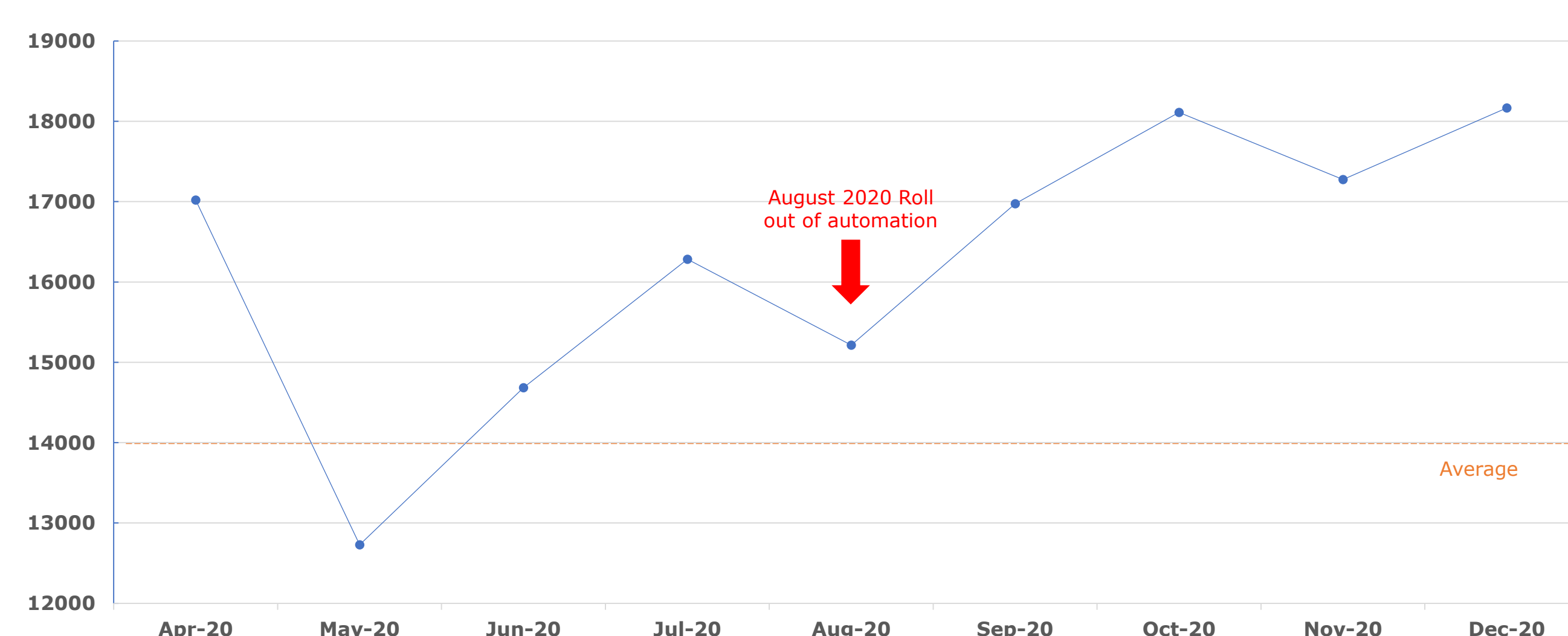

Figure 2: No of transactions

6. CONCLUSION

We have reaped benefits of increased productivity, increased pick accuracy and reduction of staff movement through automation transformation.

Future Improvement

The team will explore options for system enhancement to improve accuracy of pick quantity and also optimise use of automation system.