

### **Project Title**

Using Six Sigma DMAIC to improve the Inventory Management System

### **Project Lead and Members**

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### **Organisation(s) Involved**

Sengkang General Hospital

### **Healthcare Family Group Involved in this Project**

Healthcare Administration

### **Specialty or Discipline**

Inventory Management, Pathology

### **Aims**

To utilise the functions within excel to create a lean inventory management system to tackle challenges faced with paper based entries for the diverse range of items associated with the proper functioning of the routine biochemistry analysers

### **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, Lean Methodology, Workflow  
Redesign, Job Effectiveness, Value Based Care, Productivity, Time Saving, Operational  
Management, Inventory Management, Technology

**Keywords**

Six Sigma, Macro-Enabled Spreadsheet, Excel, Electronic Inventory System

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# Using Six Sigma DMAIC to improve the Inventory Management System



**Singapore Healthcare Management 2021**

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## Introduction

Since the inception of Biochemistry Laboratory, the inventory management has been a manual process. This process involved a lot of material and manpower wastages as we have to manually keep track of approximately 170 reagents and consumables. Some of the wastages were caused by transcription errors, lack of compliance, paper storage, duplicate entries, incomplete or no audit trail and the laborious process of flipping through the files to input entries and to check balance before ordering.

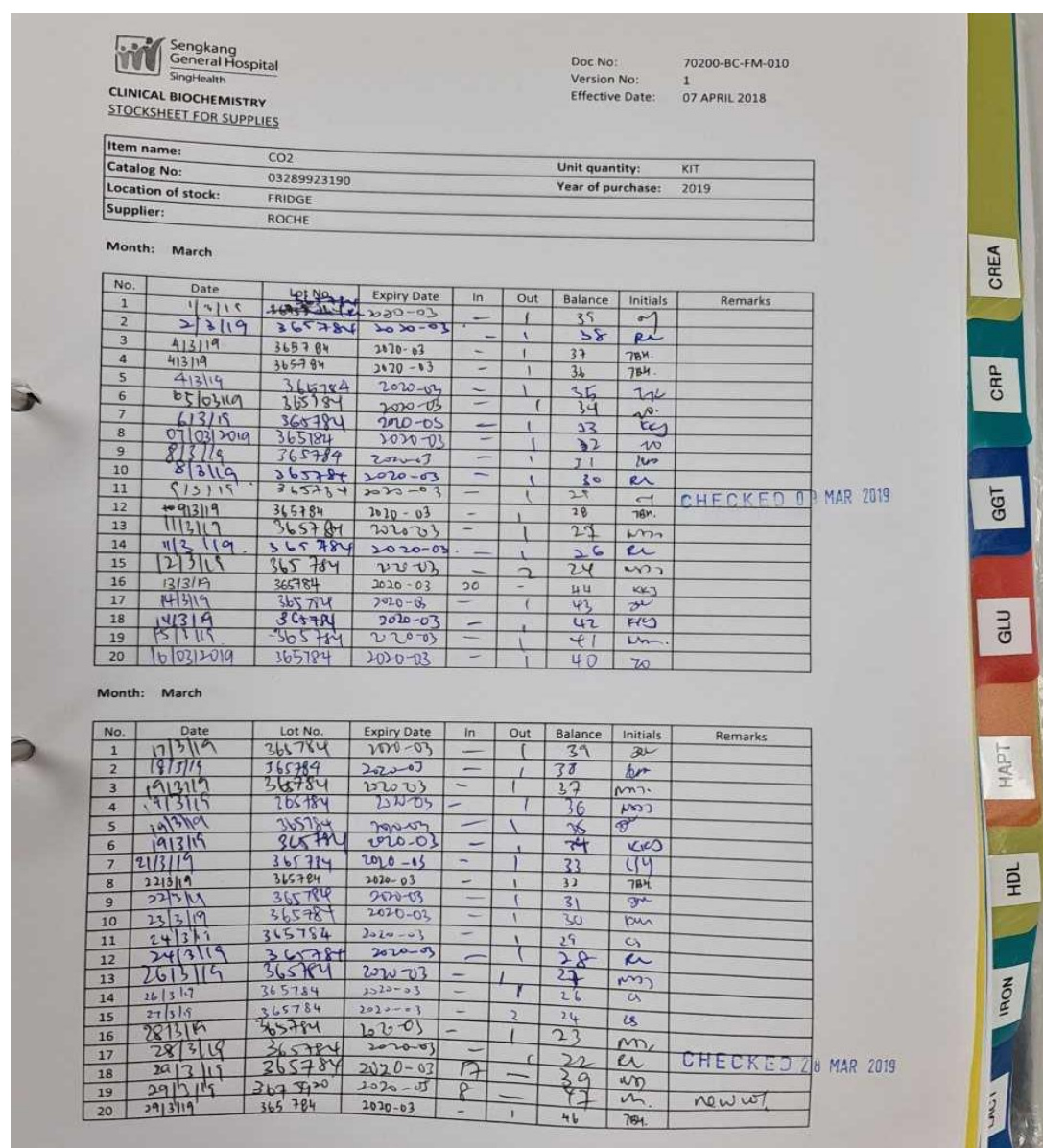
The project aims to utilise the functions within excel to create a lean inventory management system to tackle challenges faced with paper based entries for the diverse range of items associated with the proper functioning of the routine biochemistry analysers.

## Methodology

A small team was formed to look into the issues faced with the inventory management system by adopting a lean six sigma DMAIC (Design, measure, analyse, improve, control) methodology. At the end of the process, the team decided on a macro-enabled spreadsheet to replace the manual inventory system.



### Before



- Manual records of "In" and "out" for each item in their respective sheets
- Multiple erroneous entries due to illegible handwriting
- Time consuming task of flipping through the files to check for items which are low in stock or expiring before ordering

Figure 1: Manual inventory file and form

Userform (Figure 3)

- Ease of logging in and out of stock by scanning the QR or barcode
- Essential information will populate in the respective fields in either the log in page or the log out page

Figure 3: Userform for logging in or out items

### After

Figure 2: Summary page for inventory excel sheet

#### Summary page (Figure 2)

- Provides details about stocks logged in and out and quantity at hand
- Easily keep track of the amount of stocks and gauge the amount to be replenished

Figure 4: Log out sheet for inventory excel sheet

#### Log in and Log out sheets

- Contain various logical functions which extract information, such as item name, reagent lot and expiry date from the QR or barcode (Figure 4)
- Table filters allow for sorting of items for investigation or tracking purposes

## Results

The new system has thus led to the following improvements in the inventory management:

- Staff are able to reduce time required for processes involved in inventory management (Figure 5) and focus on other tasks at hand
- Data from February 2019 shows that transcriptional errors accounts for 18.8% of the monthly entries, with the new system in place, such issues are eliminated (Figure 6)
- Departmental cost savings in terms of supplies used for manual system which are absent in the electronic system, such as files, paper, dividers, etc.

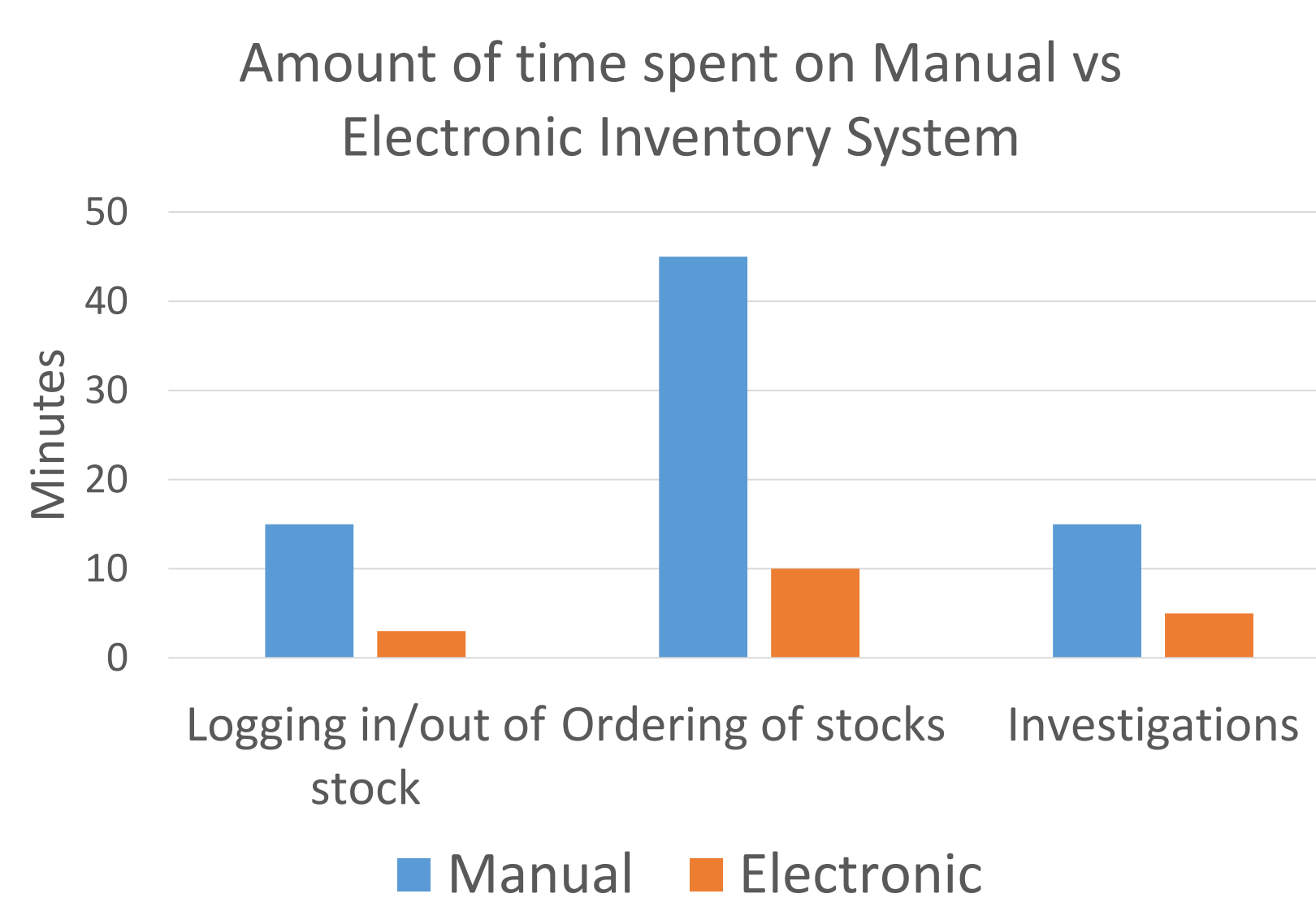


Figure 5: Comparison of time taken between manual vs electronic systems

Manual Inventory Entries February 2019

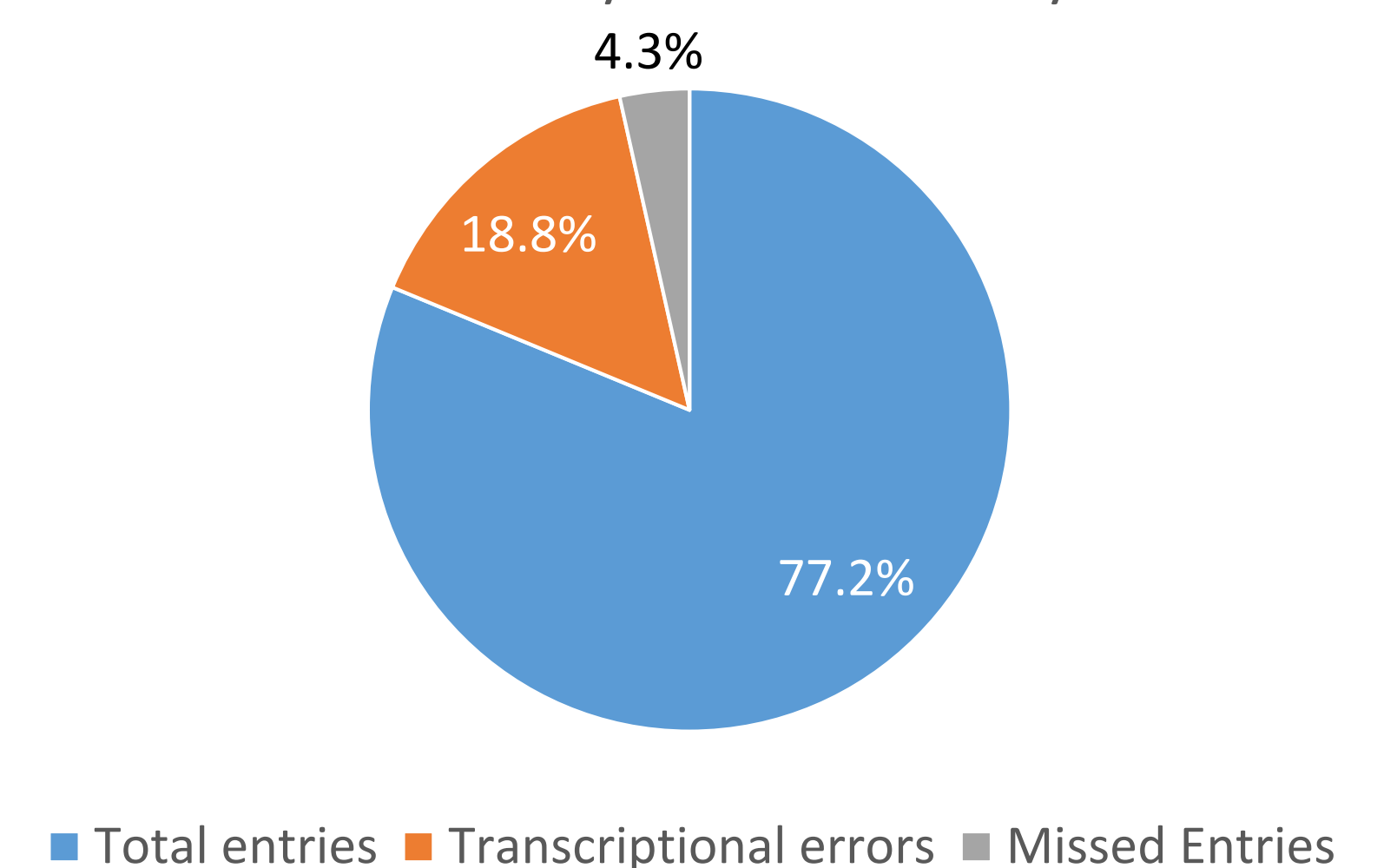


Figure 6: Comparison of time taken between manual vs electronic systems

## Conclusion

Inventory management has to do with keeping precise records of goods that are not only available but also viable for use on site. Through the lean six sigma approach, the team established a new set of workflow to enhance performance and eliminate unprofitable activities for better organisation of the great multitude of items under our charge. The team continuously works on the system to further improve and eliminate wastes generated as per the six sigma approach.