

Impact of Robotics on Patient Safety and Productivity

M. AL NEMARI¹, E. ZAYED¹, A. BIN DOUS¹, A. MALHANI¹, N. AL BANYAN¹, A. AL RASSAN¹, M. FAQEH¹, P. SHARMA², A.M. AL FAADHEL¹, A. AL SARHEED¹, M. GASHI¹

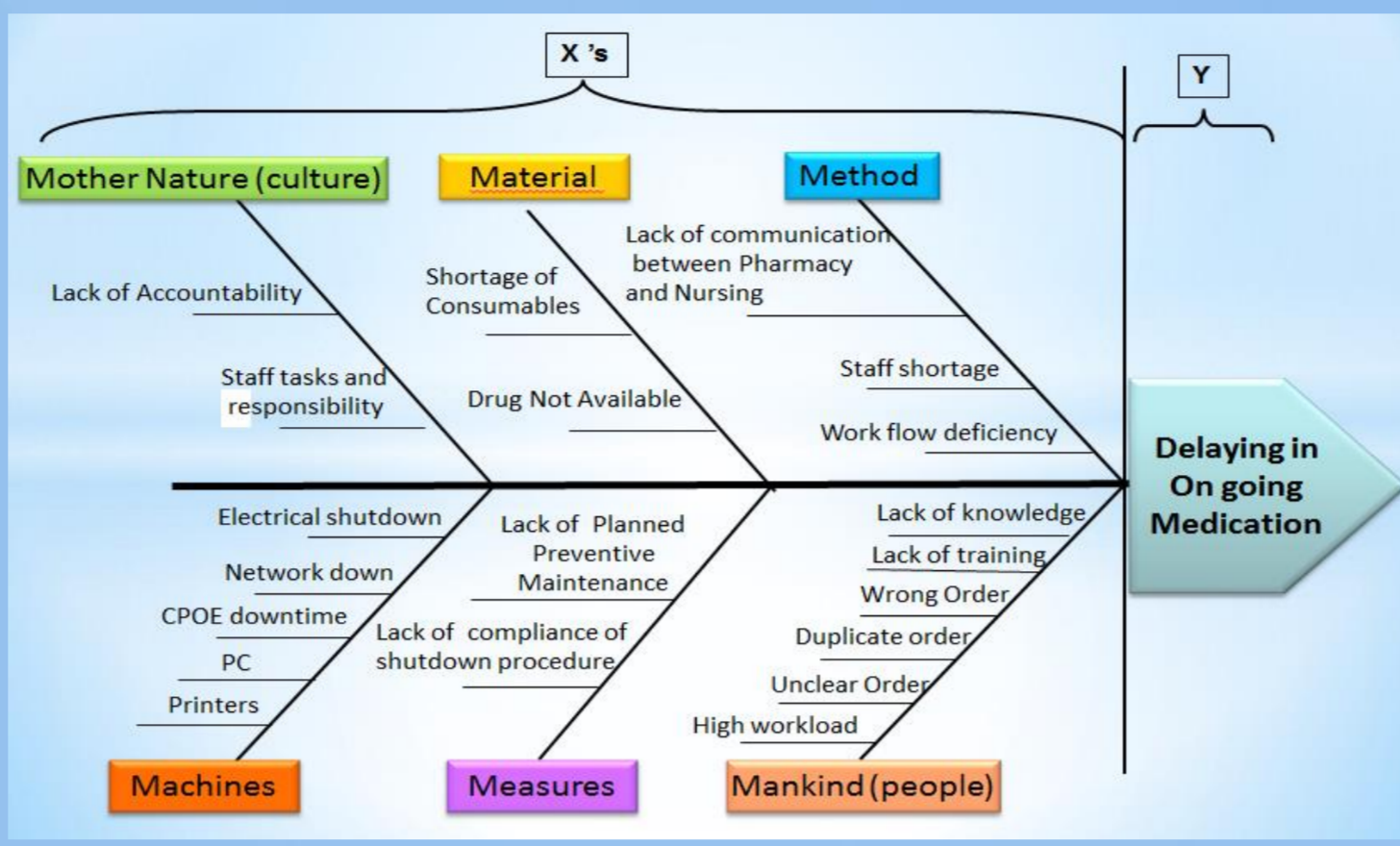
¹King Fahad Medical City, Riyadh, Saudi Arabia | ², Six Sigma, Riyadh, Saudi Arabia

Abstract number
5PSQ-099

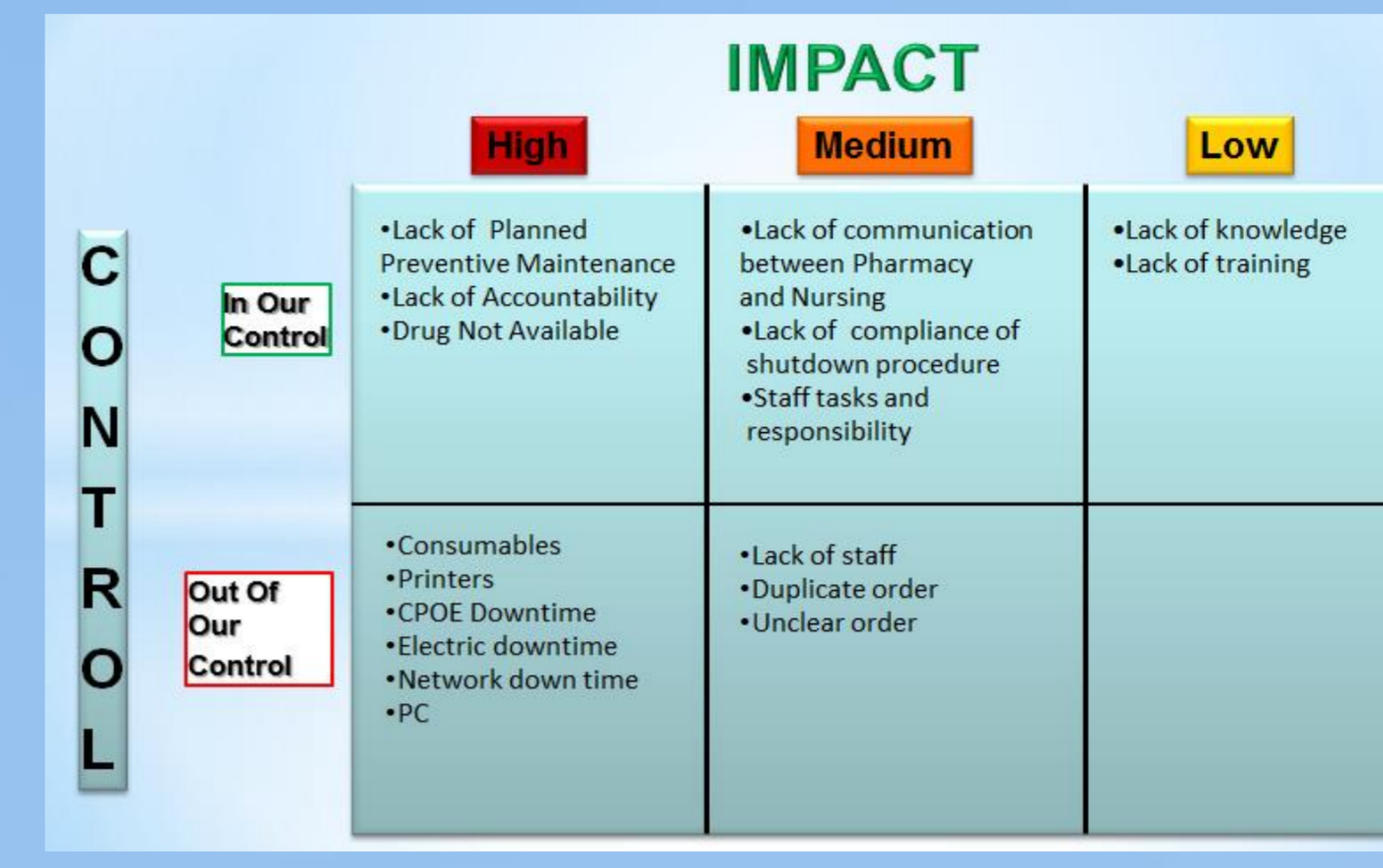
Automation is recommended as one potential mechanism to improve efficiency and patient safety. It has been proven that automation enhances the efficiency of medication distribution and its capability to reduce medication errors, increase patient safety, streamline hospital pharmacy operations, and increase accuracy. In this project, Six sigma approaches are used to study the medication process before and after automation implementation.

Analyze

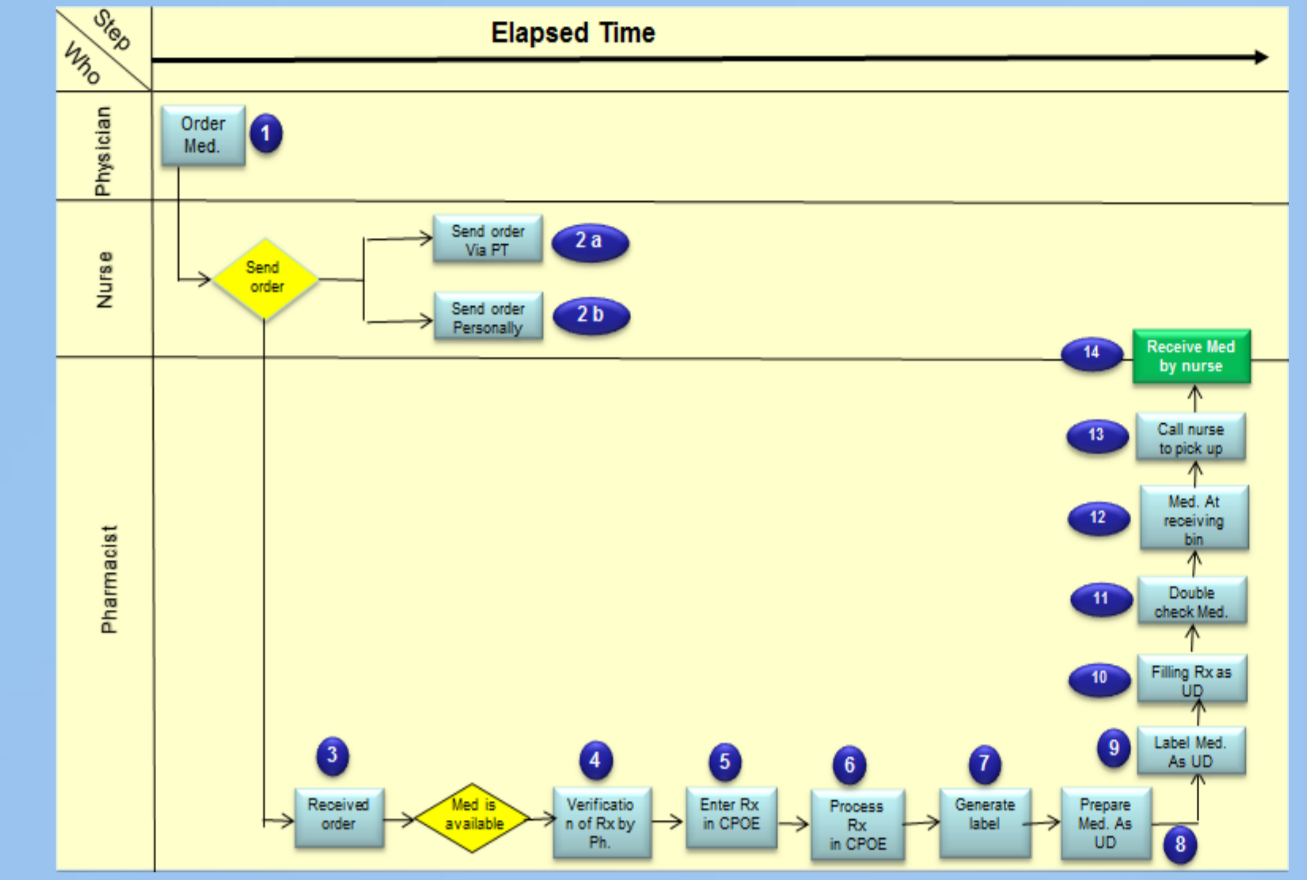
1 Fish Bone Diagram/Cause & Effect



2 Prioritization of Xs: Control / Impact Matrix 2

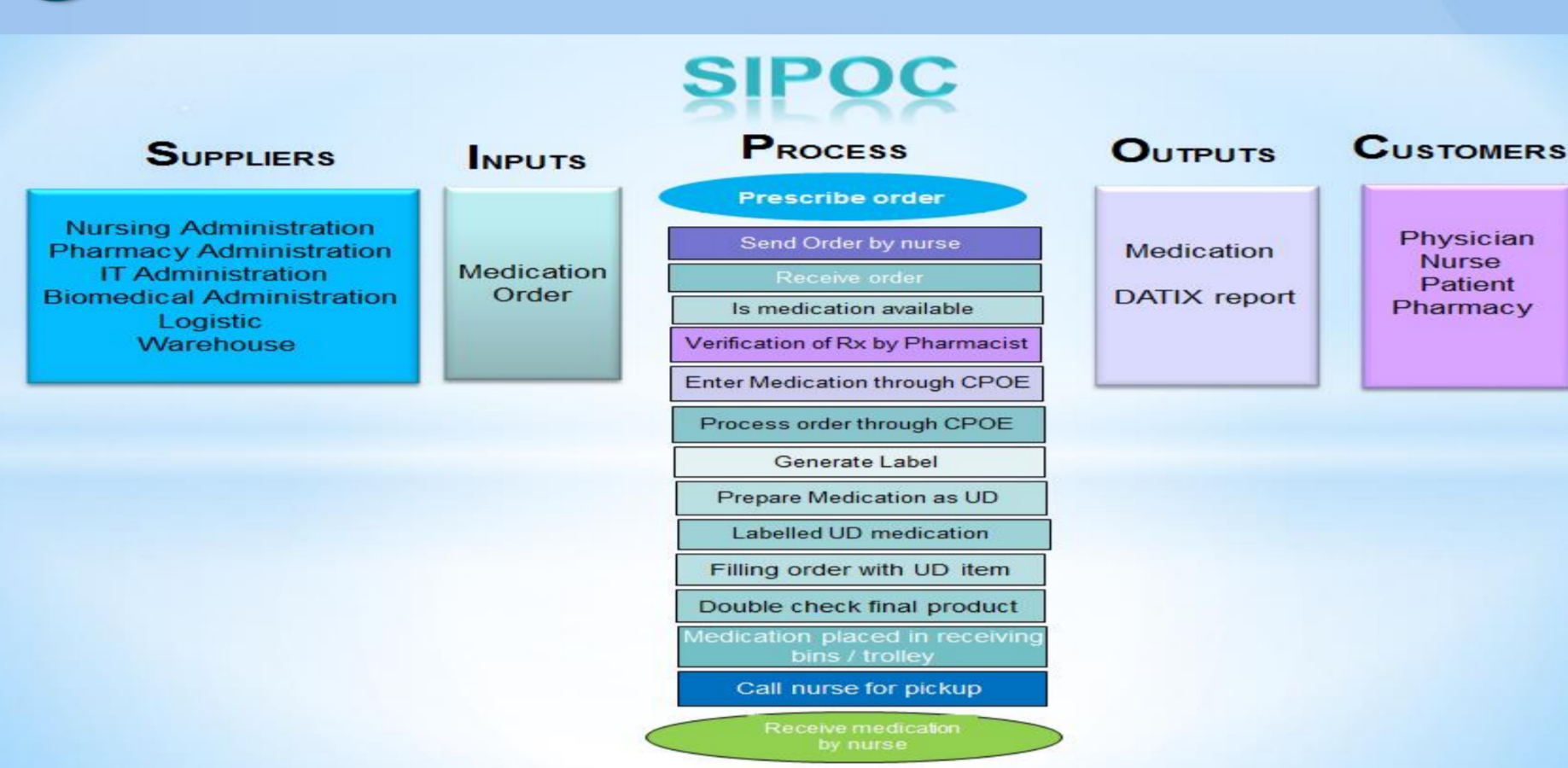


3 Unit Dose Medication Flow Deployment Flowchart



Define

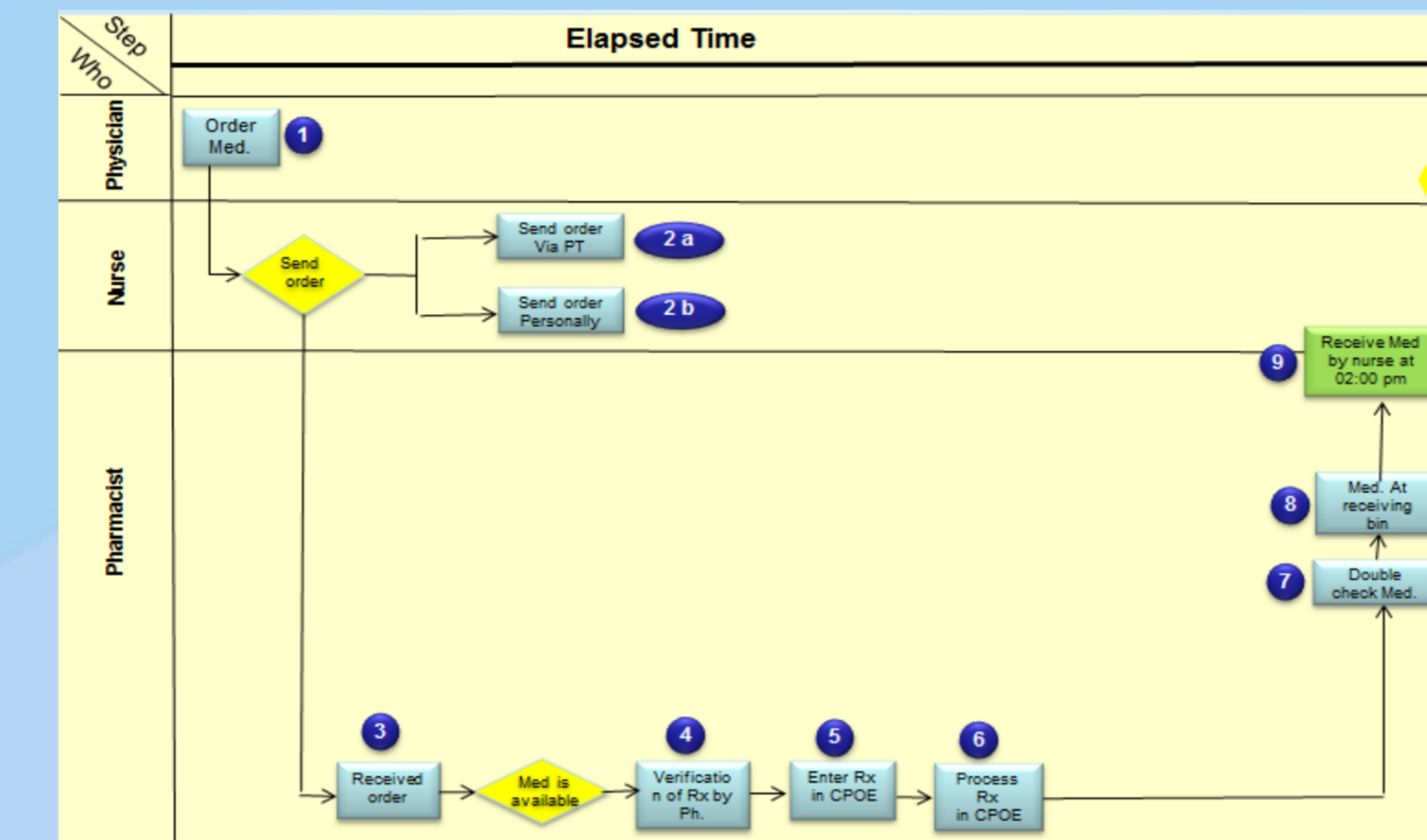
1 SIPOC



2 DMAIC Project Charter

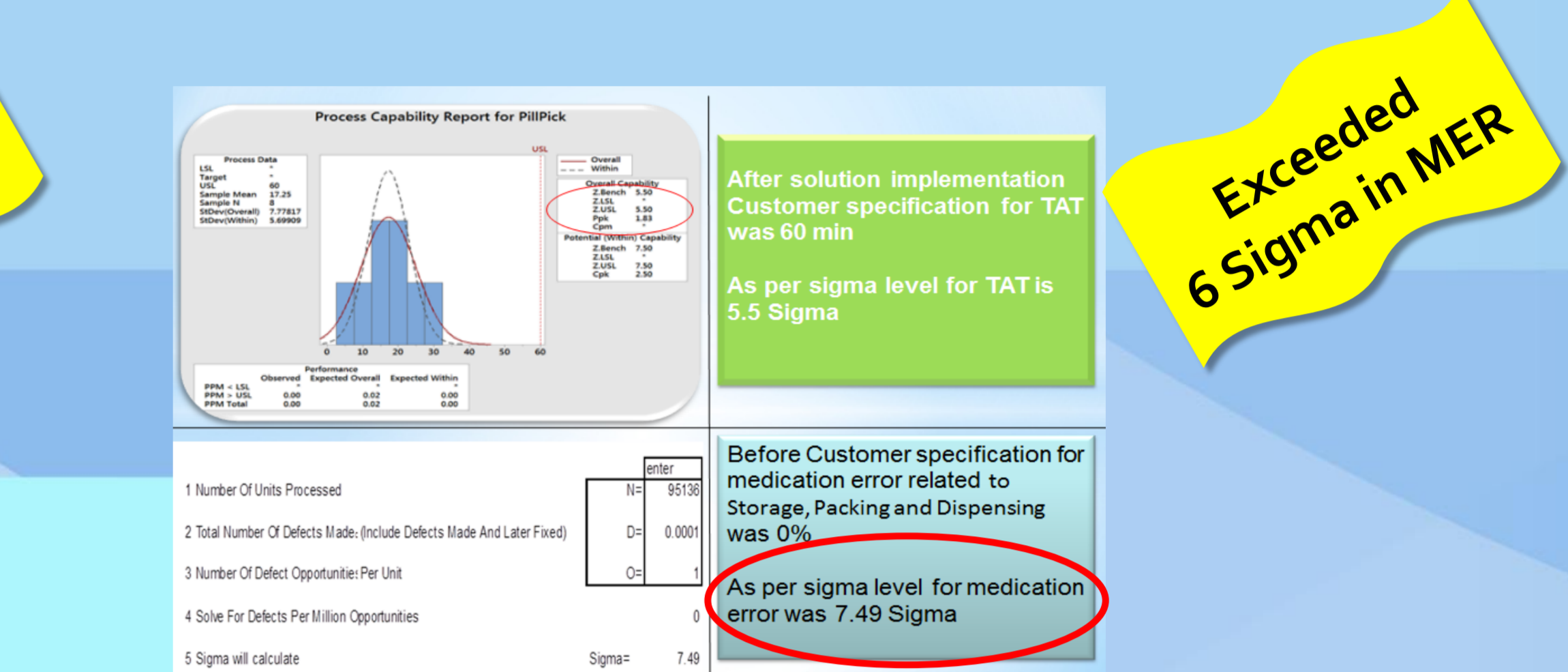
Project Name: Impact of Robotics on Patient Safety and Turnaround Time Resource Plan:	
Team Leader and Black Belt: Manal Al-Nemari	Asst.Ph. Mohammed Faqehi
Sponsor: Dr. Emad Zayed and Amal Bin Dous	Ph. Nurah AlBanyan
Process Owner: Areej Malhani	Ph. Ahmad AlRassan
Master Belt: Mr. Pradeep Sharma	Mimoza Gashi
Eng. Ahlam AlSarheed	Mete Anil Karakula
Eng. Alaa M. AlFaadhel	Arc gayeta
Problem Statement	
Main inpatient pharmacy provide medication supply for 24 hours, that's required lots of processes which include medication preparations, packaging and labeling. In 2013, we found that it takes an average of 65 minutes in the dispensing phase of medications, 24 incidents of medication errors where related to dispensing and preparing medications. Technicians spent 889 hours as over time due to high workload This lead to delay in medication administration and patient dissatisfaction.	
Goal Statement	
<ul style="list-style-type: none"> 80% Reduction in turnaround time (TAT) by the end of 3rd quarter of 2015. 90% Reduction in dispensed medication error (MER) at unit dose area by the end of 3rd quarter of 2015. 50% reduction in overtime by the end of 3rd quarter of 2015. 	
Estimate Financial Opportunities	
<ul style="list-style-type: none"> To reduce time wasted in communication between pharmacists and nurses. To improve the satisfaction rate of patients, nurses and physicians. To be a benchmark in medication management utilizing automation. 	
Customer CTQ's	
<ul style="list-style-type: none"> TAT for dispensing medications Medications Error related to dispensing Overtime in inpatient unit dose area 	
High Level Project Milestone	
Define Phase:	June 1 st - June 5 th
Measure Phase:	June 6 th - June 30 th
Analyze Phase:	July 1 st - July 14 th
Improve Phase:	July 15 th - July 30 th
Control Phase:	August 1 st - 30 th

1 Strategy for change Automated Unit Dose Medication Deployment Flowchart



9 Steps Streamlined Process

2 Measurement of improvement & Effects of changes Sigma Level - After

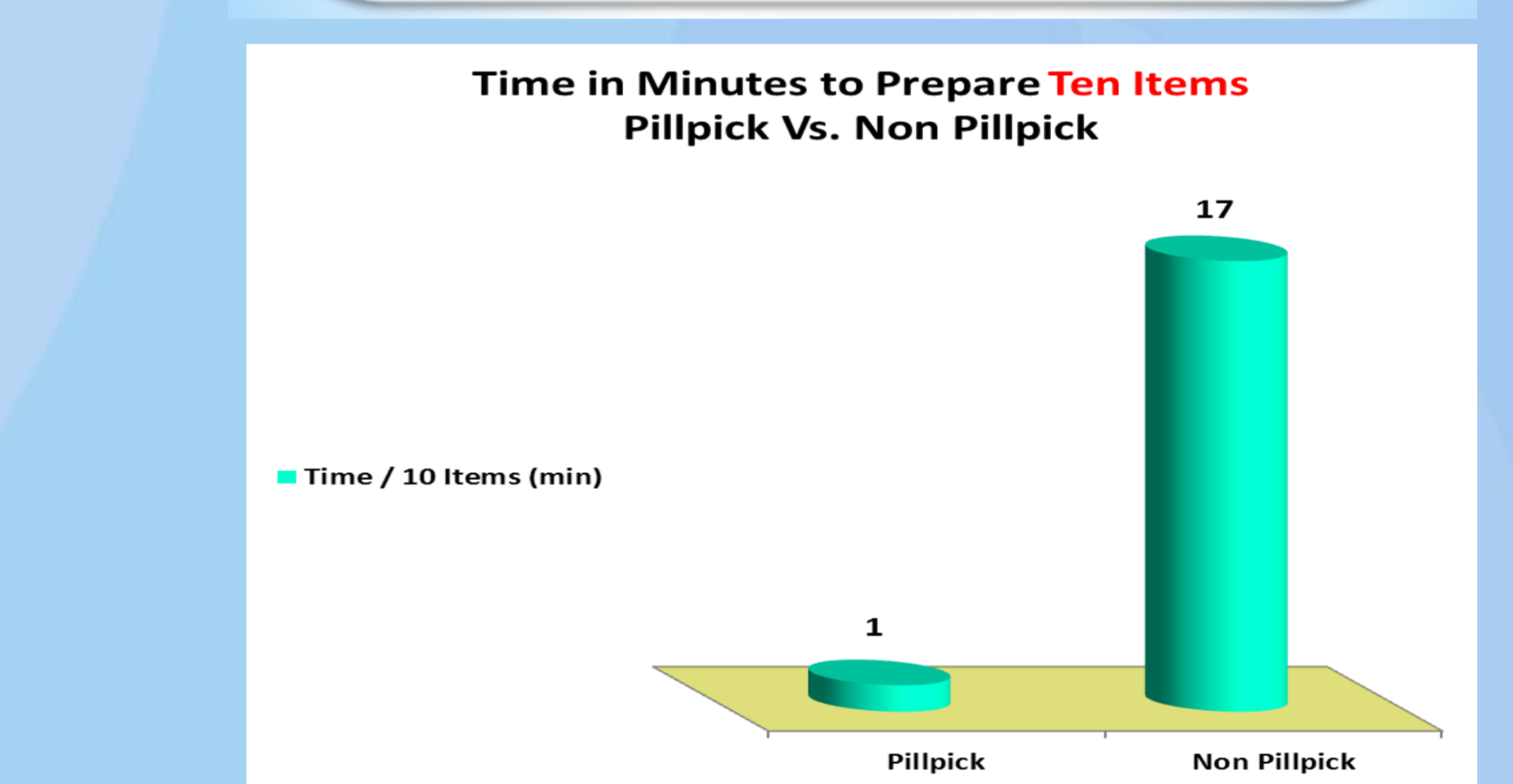
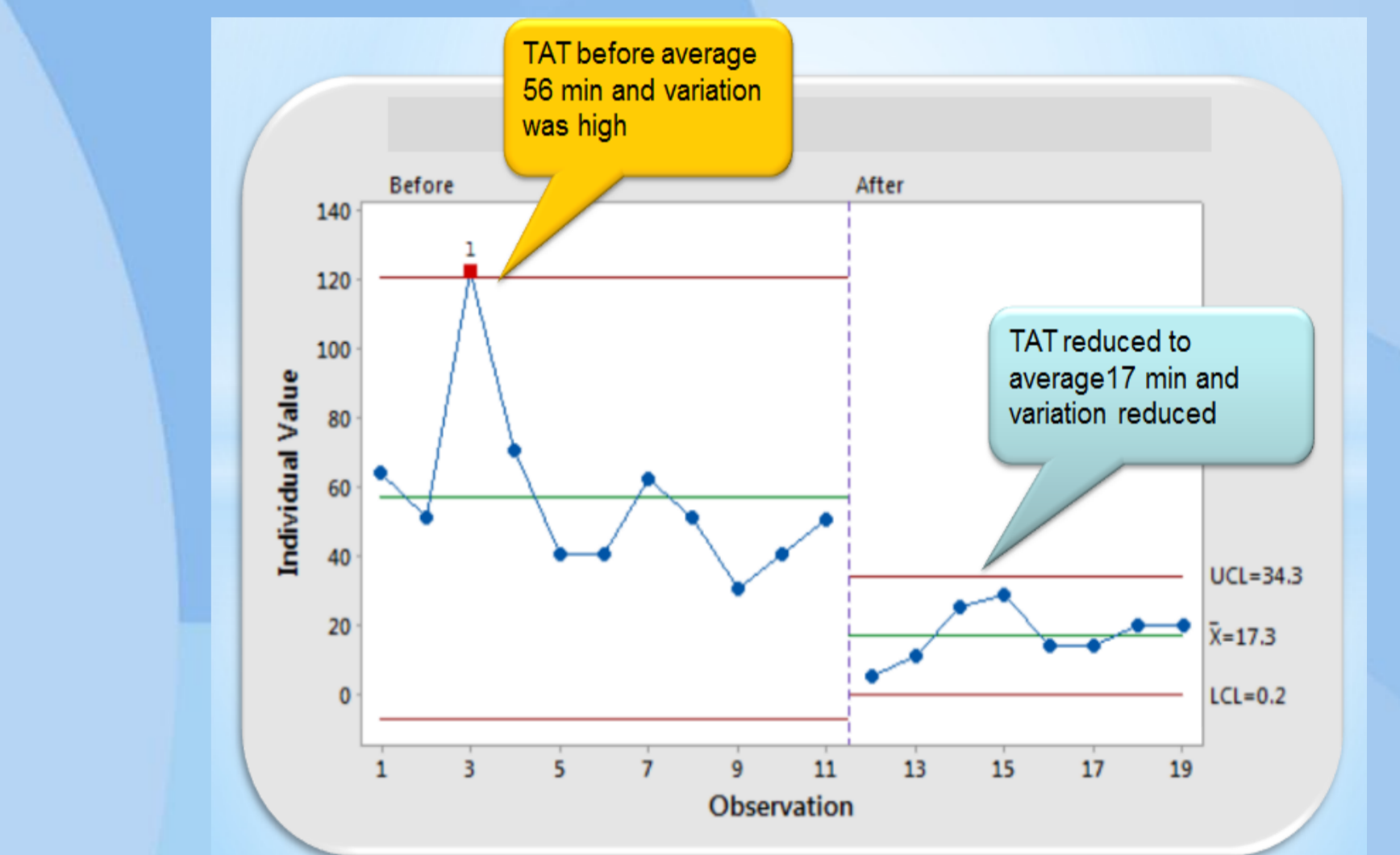


Exceeded 6 Sigma in MER



Transforming of the Inpatient Area

3 TAT Comparison Before & After by Using Control Chart

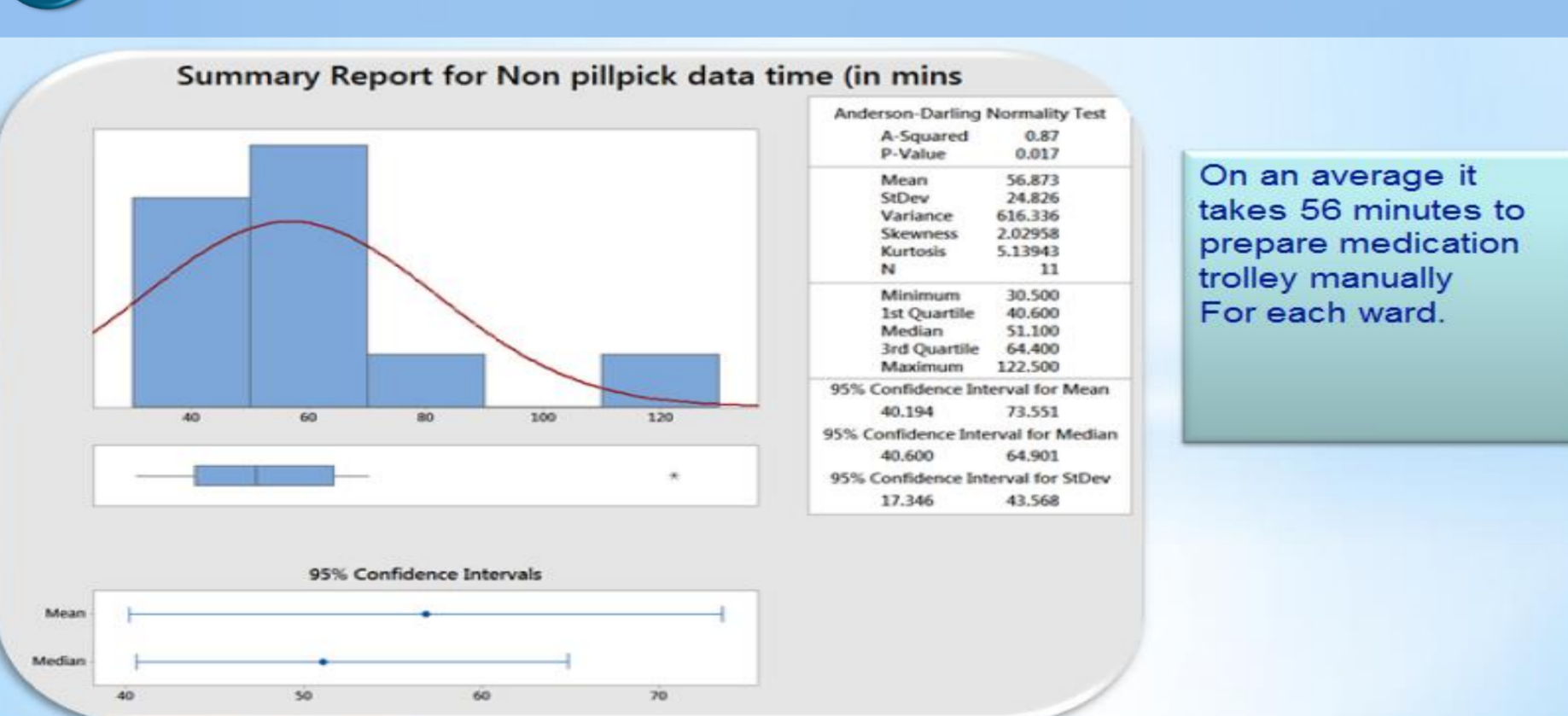


Measure

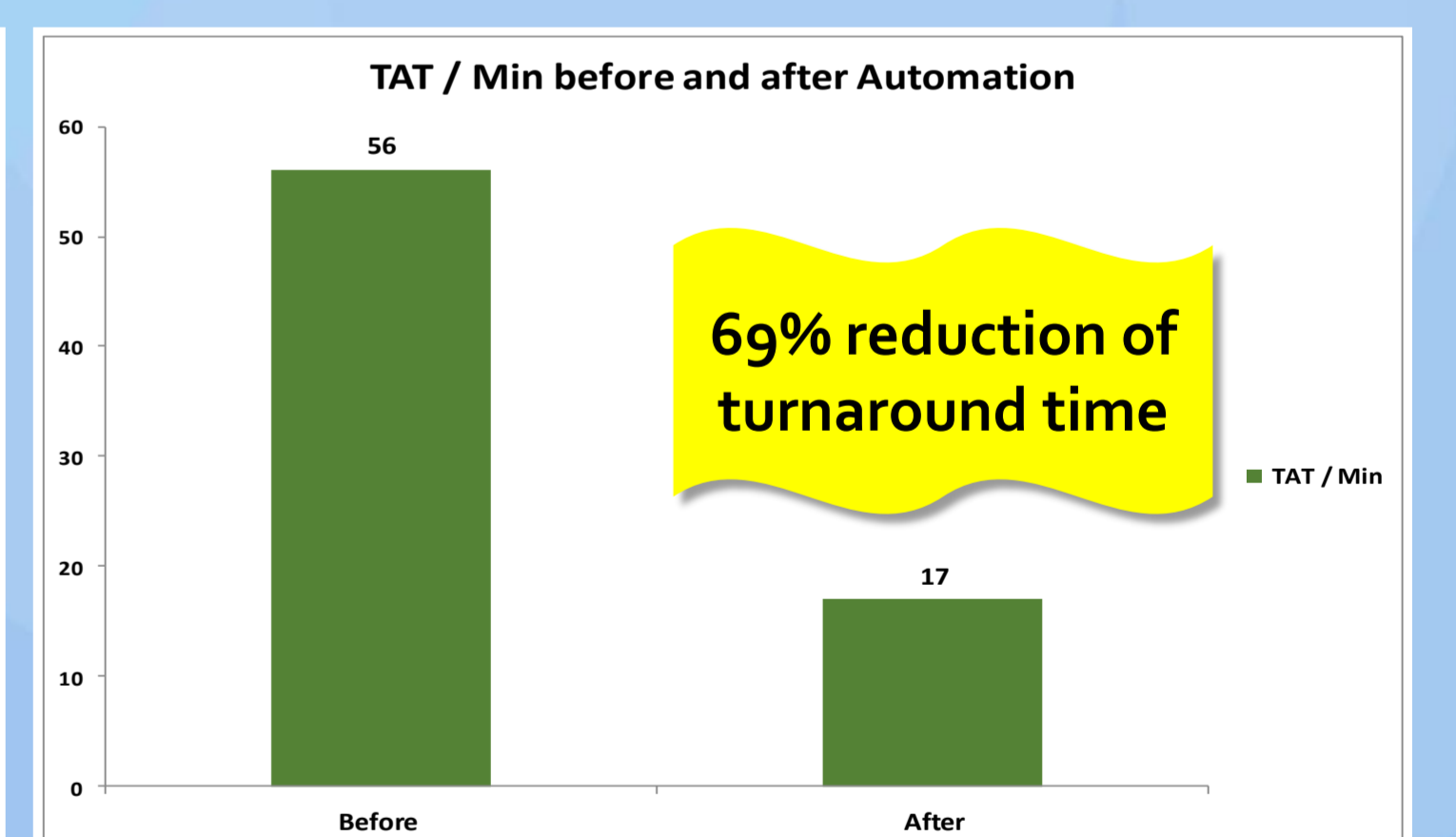
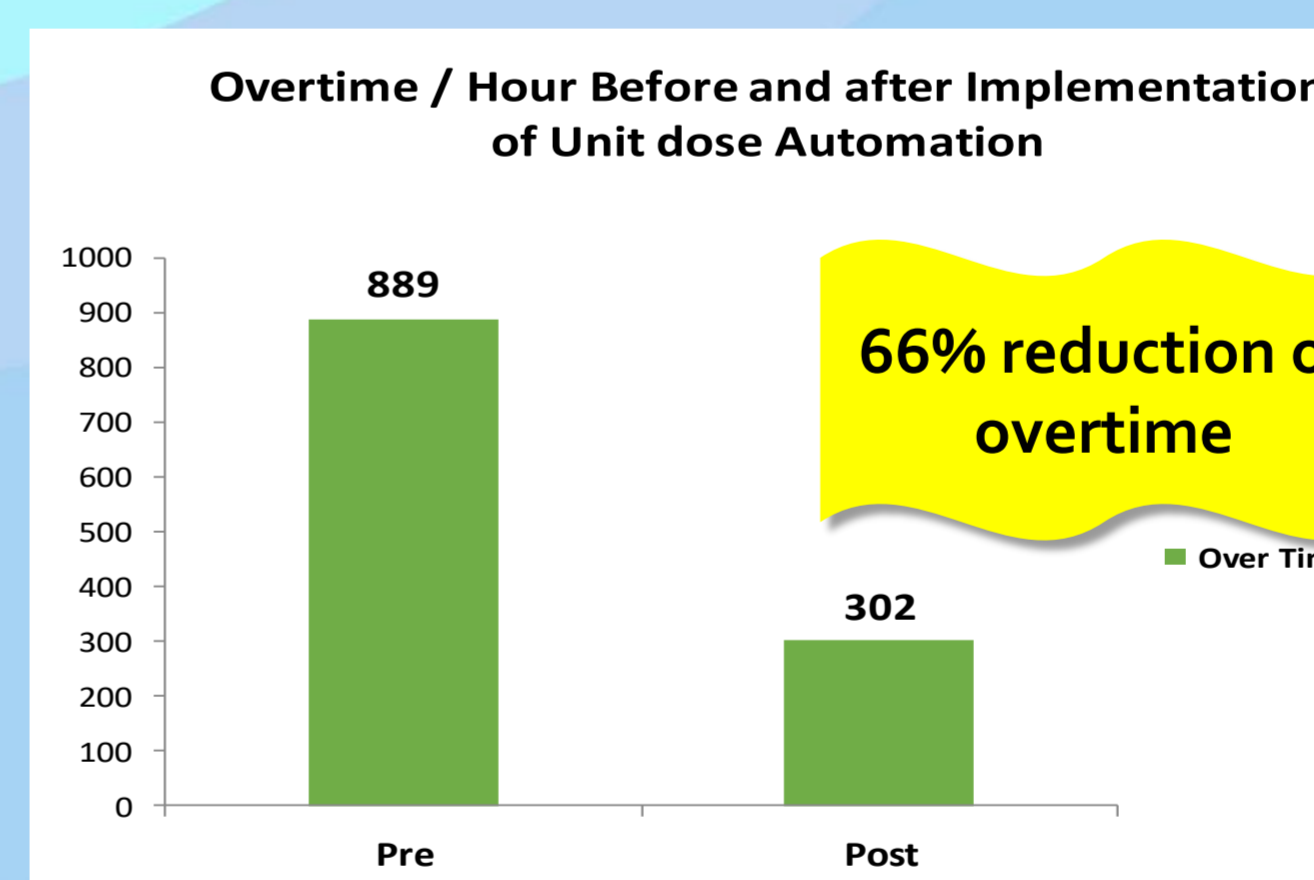
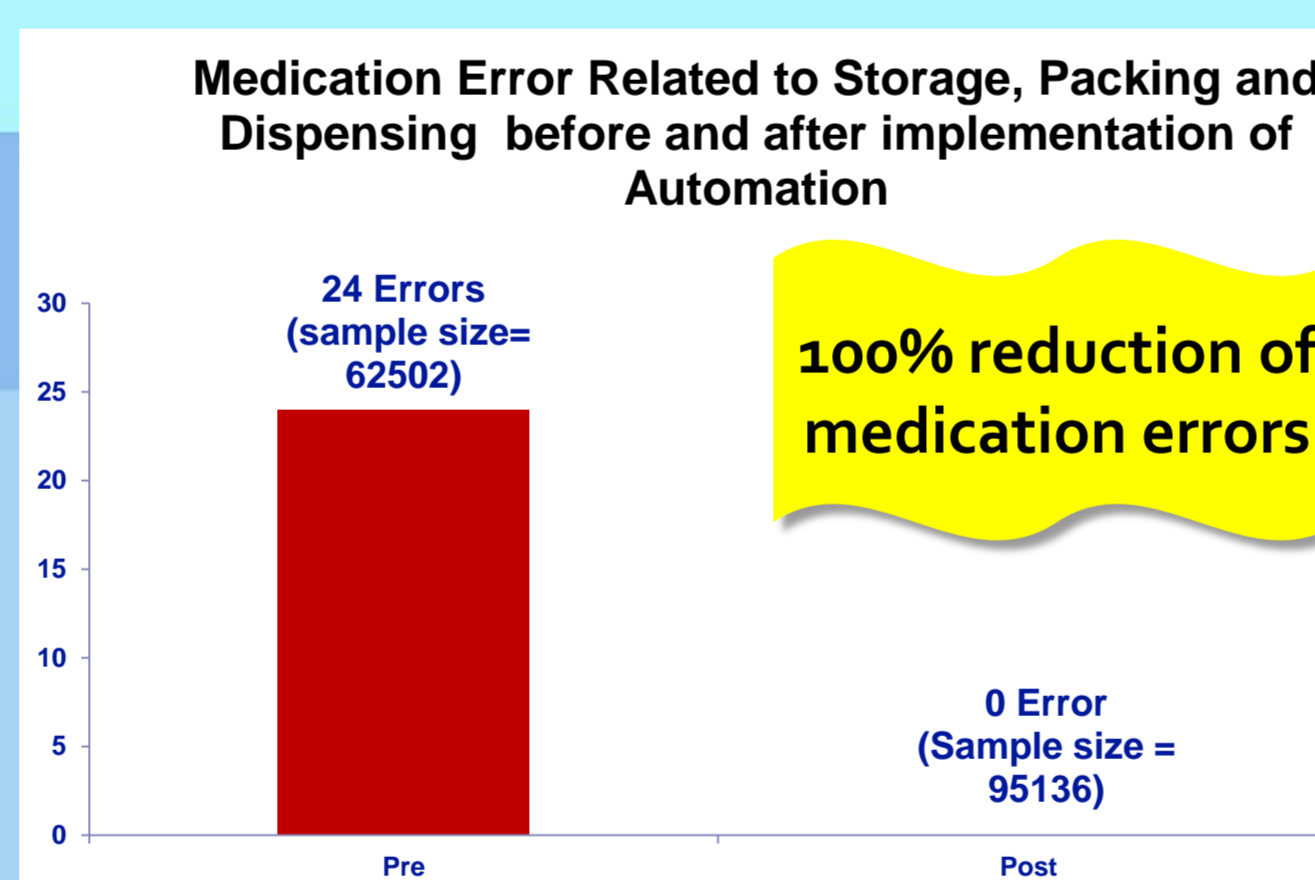
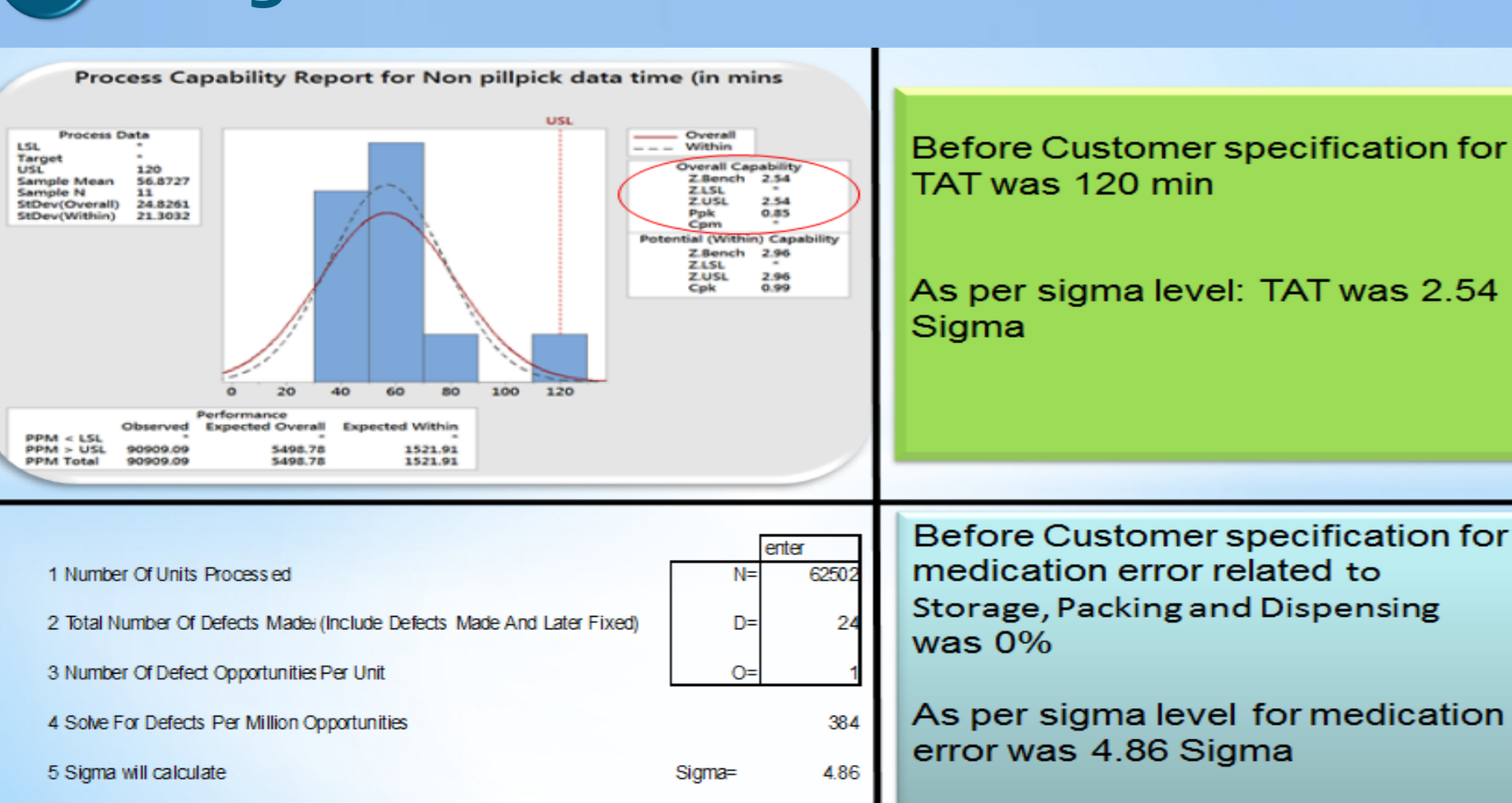
1 Data Collection Plan Worksheet

CTQ	Measure Description	Data Type	How many ?	How Collected	By Whom
Turn Around Time (TAT)	Time of receipt of Rx from nurse to the time medication received by nurse	Continuous	99 Patient before and 96 patient after automation	Data collection sheet then measure it through 6 sigma level	Pharmacy staff
Medication Error (MER) Related to storage, packing and dispensing	Number of medication Error	Continuous	Data of one year before and one year after automation.	MER-reporting system (DATIX)	IT
Overtime	Number of overtime hours to cover duty.	Continuous	Overtime: data of one year before and one year after automation.	Overtime sheet	Pharmacy staff

2 Measurement Data Display



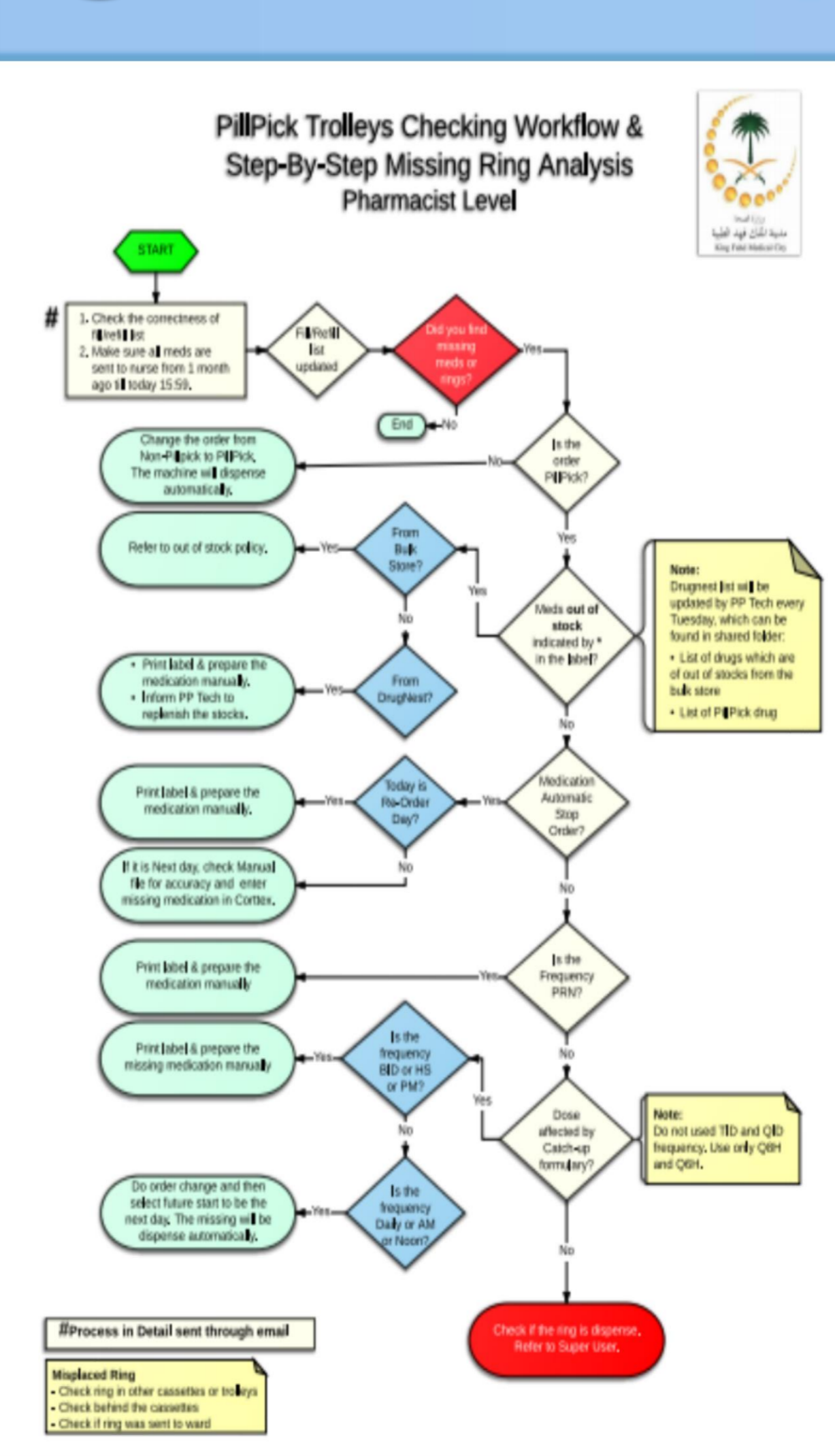
3 Sigma Level - Before



Control

Message for others: (Recommendations & Sustainability plan)

1 Create User Guide



DPO & Sigma before measurements: DPO = 24 from sample size = 62502 Unit dose item Sigma level for TAT= 2.54 Sigma level for MER= 4.86

DPO & Sigma after measurements: DPO = 0 from sample size 95136 Sigma level for TAT= 5.5 Sigma level for MER= 7.49

Six Sigma Net Income:

- 69% improvement of TAT
- 66% reduction of overtime due to automation
- 100% improvement of Medication Error.

Opportunities identified:

- Report any system error through Datix report
- Higher administration evaluate new EHR.
- Invest in training more staff.
- Continuous Awareness of Nurse staff.

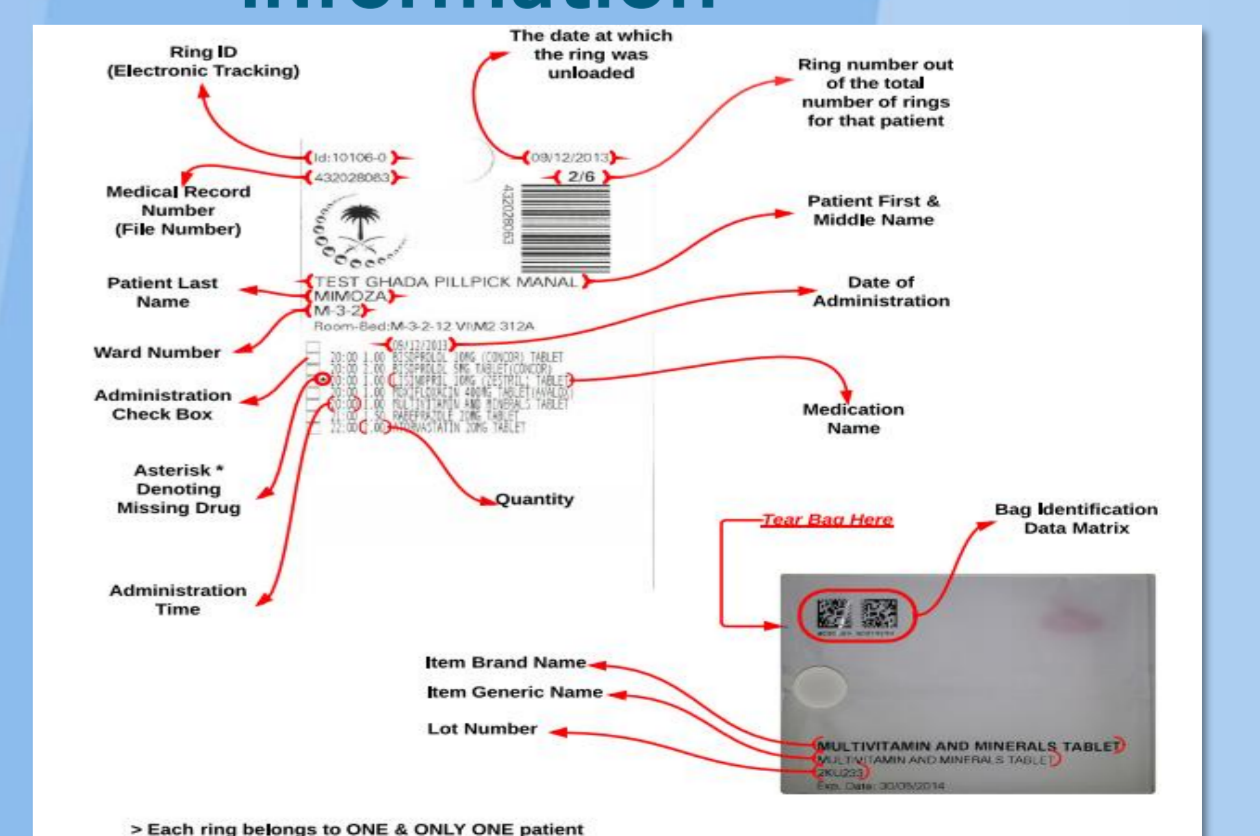
Lessons learned:

- Continuous monitoring as a Key Performance Indicator and timely Information sharing among stakeholders are very critical to success of Medication Dispensing and Patient Safety.

2 Downtime Procedure

Failure / Disruption Scenario	HIS / CorTex Failure
Communication Requirements	Local Teams Only: - All Members of Emergency Team: -
How much time can you tolerate the disruption? Recovery Time Objective	How much loss of data can you afford? Recovery Point Objective
Current Risk Level: High	Residual Risk Level: High
Business Continuity Procedures	
1. ITD to announce through Postmaster regarding the disruption and the likely time it may take to resolve or bring to normal again.	HIS Project Manager
2. Disaster Management Office to announce the appropriate Code and coordinate with Pharmacy Teams.	Disaster Management Office
3. If the disruption is take one hour, then decide on going Manual.	Pharmacy Supervisor

3 Poster of Bag and Ring information



4 Escalation Procedure

Escalation Procedure for PIPICK Issues:	During Working Hours	After Hours
First Level Support	Area Supervisor Pharmacy IT (3628/2739)	On-call Supervisor (3629)
Second Level Support	PIPICK: Salem Ehsani (0557435566) or Aro Gayeta (0558062235) Rihabody: Alaa M. AlFaadhel (0533300213) Cortex: Nouf Abdulrahman S. AlJoufi (0566115552)	
Third Level Support	Vendors	
Fourth Level Support	IT Executive Director	

