Right to Operate Training Metric Improvement Using DMAIC Methodology

Author: Magaly Peña Castillo

Advisor: Carlos González, Ph D.

Manufacturing Competitiveness in Pharmaceutical Product

Abstract

This research Project was focused in understanding why operators are unable to complete their trainings on time. Thus impacting manufacturing support and increasing the effort of those operators that are qualified and ready for execution. Not having all operators within a team ready impacts the manufacturing process. The DMAIC methodology was implemented to improve training metrics of operators to be ready for manufacturing support. The DMAIC methodology provides structure and tools to improve a process by optimizing and sustaining business process. This research seeks to involve operators and make them part of the solutions.

Introduction

Production process teams are having difficulties to complete training requirements needed to execute their assigned tasks. This situation results in increased efforts for those operators that comply with training requirements and thus are ready to operate. Leading to overtime and operators not able to support the operation. In the past, various six sigma projects were implemented to improve the training process for operators. Still today, we continue to have the same delay in having operators ready for operation. In the last 13 months, overdue training metrics median for Team 1 is (0.57%) and for Team 2 (0.87%). The goal is to decrease these percentages to have operators ready for operation support. The DMAIC methodology will be implemented to achieve this goal. This project will pursue to understand from the operator's and Process Teams perspective gaps in the process. Operators are directly impacted and their input will lead this project to implement improvements to have operators ready for operation support and in compliance.

Research Objective

This project aims to achieve a reduction in Team 1 and Team 2 overdue training requirement median by 0.40%. This will reduce the increased efforts from behave of already qualified operators, reduce overtime and contribute to have all operators within a team supporting production activities.

Methodology

To achieve the goal of operator's readiness for production support the DMAIC tools project methodology was used.
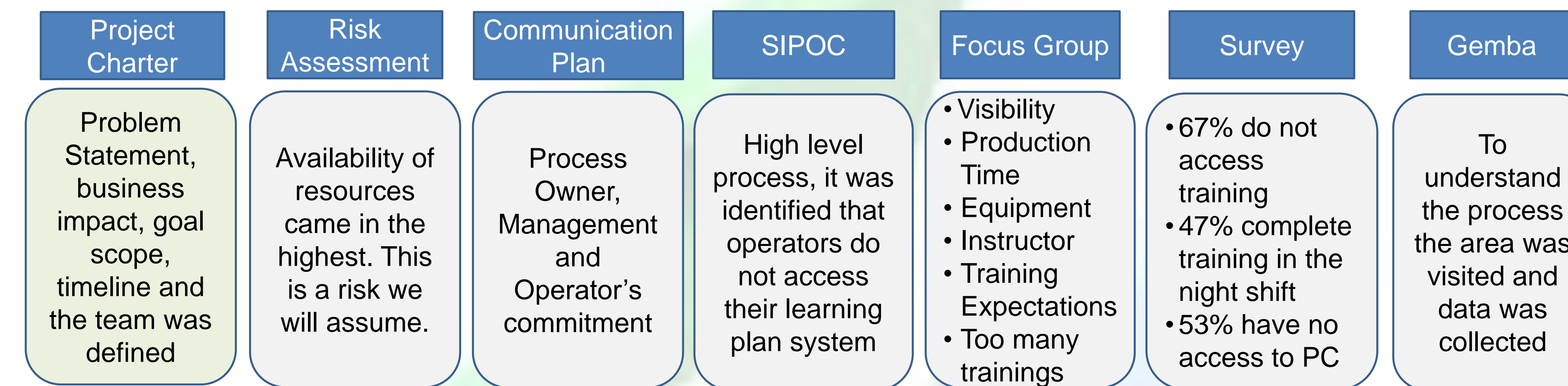
**Figure 1
DMAIC Methodology**

DMAIC is an acronym for a series of steps used to measure defects in business processes and improve profitability. The DMAIC problem solving method is a roadmap that can be used for any projects or quality improvements that needs to be made. The term DMAIC stands for the five main steps in the process; Define, Measure, Analyze, Improve and Control.

Results and Discussion

Define Results

In this phase the following tools were used:

Project Charter	Risk Assessment	Communication Plan	SIPOC	Focus Group	Survey	Gemba
Problem Statement, business impact, goal scope, timeline and the team was defined	Availability of resources came in the highest. This is a risk we will assume.	Process Owner, Management and Operator's commitment	High level process, it was identified that operators do not access their learning plan system	• Visibility • Production Time • Equipment • Instructor • Training Expectations • Too many trainings	• 67% do not access training • 47% complete training in the night shift • 53% have no access to PC	To understand the process the area was visited and data was collected

As part of the Survey, operators were asked in what priority do they see trainings. Only 25% of the operators see training as critical. See Figure 2.
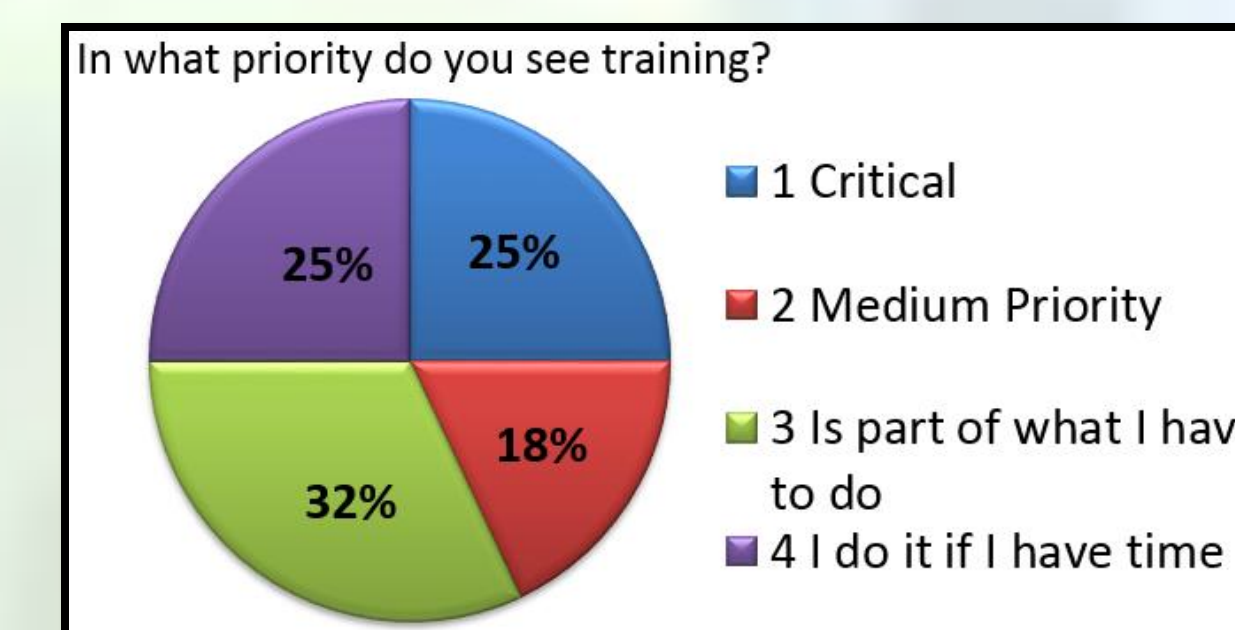
**Figure 2
Survey Results**

Measure Results

The data collected in the define phase was measured to determine types of defects and metrics. The data was compared to the one collected in the operators survey results.

Overdue Metric for the last 7 months, 530 observations:	Operators Learning Plan was analyzed as for instructor-led vs self-study trainings:	Monthly training load was measured
• 21 of 88 operators go overdue representing 21%	• Team 1: 51% IL & 49% SS • Team 2: 54% IL & 46% SS	• Trainings ranged from 5 to 11 per month • Operators work 174hrs/mth • Trainings represent 3hrs to 6hrs per month

Training completion distribution was measured as for Day, Night and Weekend. Result: 64% of trainings are complete during the day shift. See Figure 3.
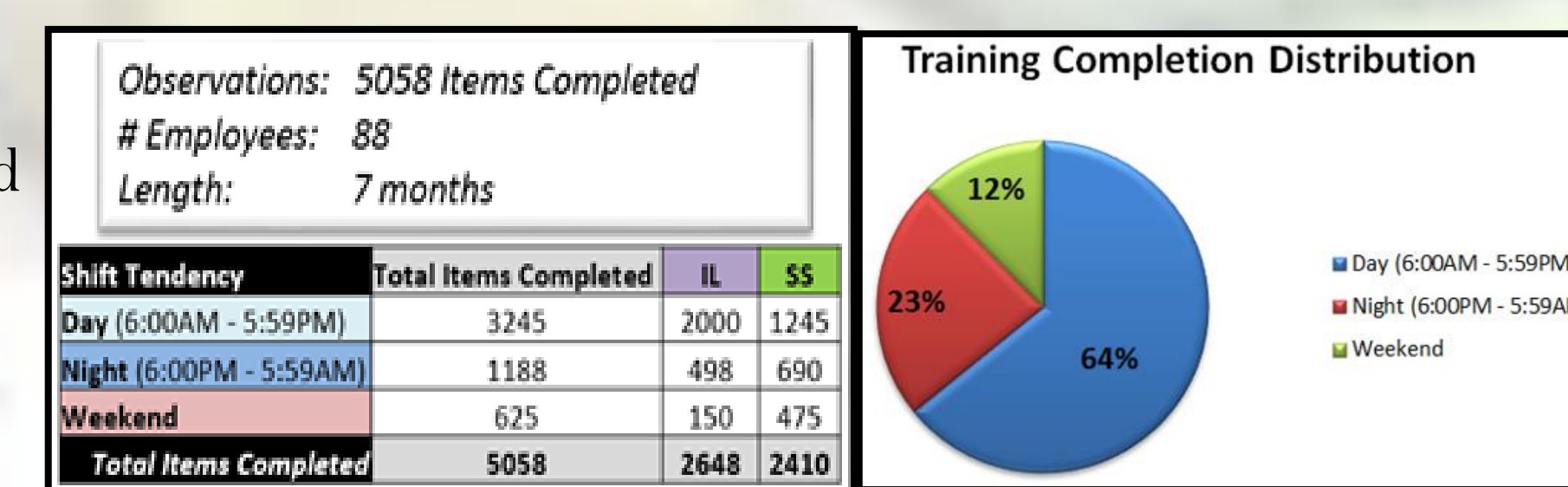
Observations:	5058 Items Completed		
# Employees:	88		
Length:	7 months		

Shift Tendency	Total Items Completed	IL	SS
Day (6:00AM - 5:59PM)	3245	2000	1245
Night (6:00PM - 5:59AM)	1188	498	690
Weekend	625	150	475
Total Items Completed	5058	2648	2410

**Figure 3
Overall Training Completion**

Self-Study completion was measured, these are trainings that can be completed in their computers at any time. Result: 52% complete self-studies during the day shift. See Figure 4.
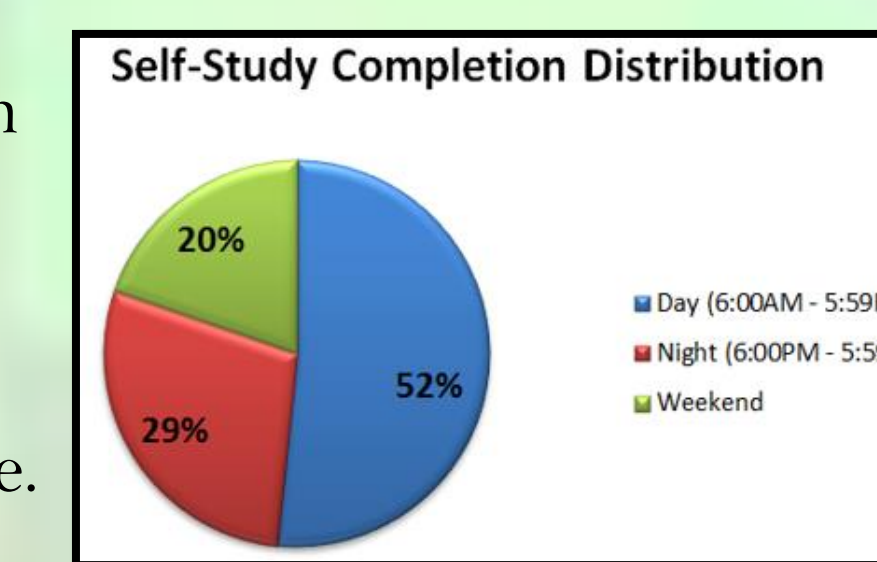
**Figure 4
Self-Study Completion**

Value Stream Map Observations were:
• 6 different ways operators know they have a training missing, some operators complete training without verifying if they are missing, some operators rely on their supervisor, most operators do not access their learning plan, Operators see themselves out of this process, they think they are not directly responsible for completing their trainings.
✓ Quick win – More computers were installed in the control rooms

Analyze Results

In this phase the value stream map and metrics were analyzed. The findings were:
• More trainings are completed during the day shift. There's a element present during the day shift that is not present during the night and weekend shift. Triggers are management, instructors and Training Department.
• 1,245 of self-studies could had been distributed differently.
• Operators rely on follow-up to complete their trainings.
• Insufficient time for training completion.
• Training documents not available during night and weekend shift.
• Insufficient instructors for safety trainings.
• Opportunities for Shift Supervisor to plan production schedule activities integrating training offerings.
• At this point, operators see themselves out of this process.
• Since there are no consequences, training is not part of their priorities.

Results and Discussion

Improvement Phase

It was made clear to management that we had a cultural issue as to clearly establish responsibilities. Management met with operators to clarify that they are directly responsible for completing their trainings on time. Shift Supervisors will support, facilitate and coordinate area activities that will allow operators to assist to trainings. Other improvements were:
• Learning system management orientations
• Operators can access training documents at any time. Waiting time from 6hrs - 65hrs went down to 0 waiting time.
• Operators have everything in one system (visibility): see their learning plan, obtain training document, see training offerings and when they register an automatic invitation is setup in their calendar that works as a reminder.
• Sessions during the night shift are available as required.
• Trainings will have a minimum of 15 days to put effective to allow enough time for training. Less time will required a justification and approval from management.
• Instructor-led trainings that in its revision have little or no high impact changes will be available as a self-study.
• More computers available
• Low impact safety trainings will be offered by identified operators. Allowing to be offered during night/weekend shift.
• An electronic tool was created for the Shift Supervisor to facilitate coordination. Planning training activities took them an average of 49 mins, now it only takes them 5 minutes. This tool was a great implementation to help Shift Supervisors have fast visibility and ease the process management for trainings.

Control Phase

For improvement sustainability, monthly metrics visibility to supervisors will be sent by the Training Department. Process Owner's will monitor their teams remain under 0.15% overdue thru their process team meetings. Action items will be established and discussed with shift supervisors. The Training Department will continue to simplify instructor-led trainings to convert to self-studies. Management will support and ease the process for operators training time for completion.

Conclusion

All improvements were implemented. Once the control phase was reached we measure our project goal and saw that metrics exceeded the goal. Teams 1 and 2 reached 0% overdue. This project focused in the client and was able to make adjustments that eased the process for operators and shift supervisors. Also made management aware that they are essential in the sustainability of the improvements.

References

1. B. Henderson and J. Larco, *Lean transformation: How to change your business into a lean enterprise*, Oaklea Press. 2000.
2. J. Maxey, M. Price, D. Rowlands and M. George, *The Lean Six Sigma Pocket Tool Book*, New York, USA, McGraw-Hill, 2005