

# Lean Six Sigma Green Belt Certification Course

DIGITAL  
OPERATIONS





## Project: Improve Phase



# Improve Phase

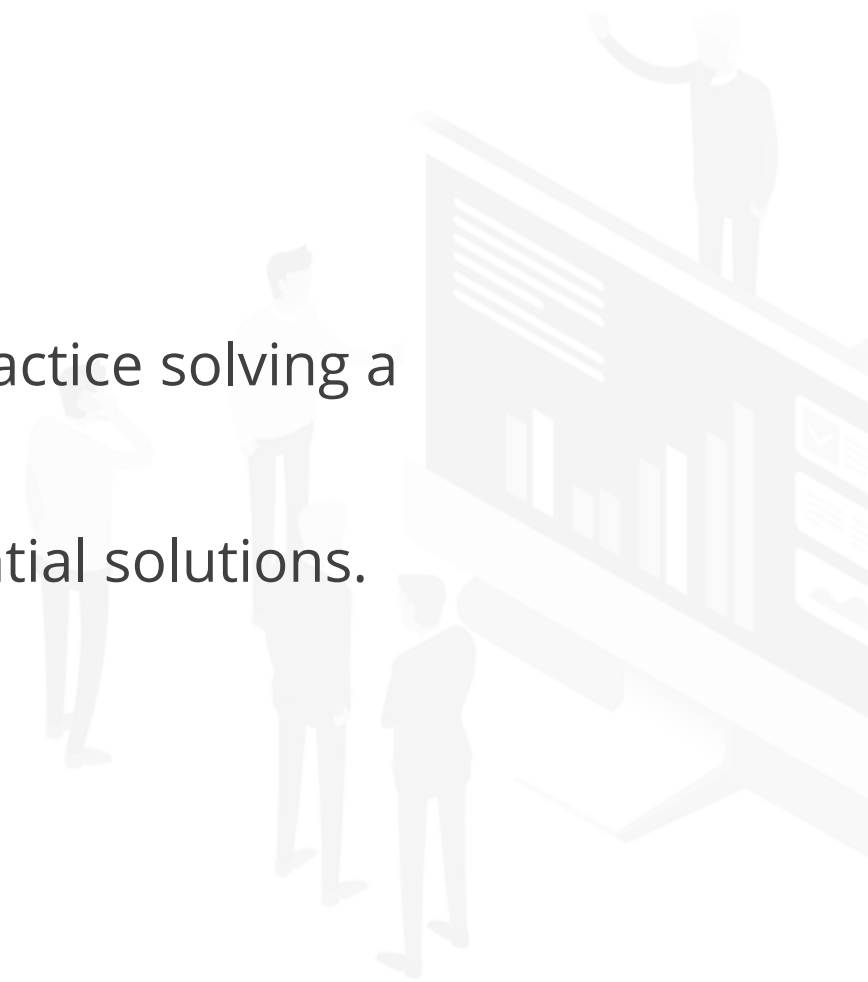
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This case study is a project simulation. As we complete each Phase of the DMAIC (Define, Measure, Analyze, Improve, and Control) process, different aspects of the case study will be presented to you. You will be given background information, instructions, data sets, project updates, and all necessary information to work through each step of the project and answer questions.

## **Note:**

You will be using only some of the DMAIC tools and techniques in the case study to practice solving a single problem.

The provided solutions are not the “perfect” answers; they are only one of many potential solutions.



# Project Update: Outcome Summary

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Through hypothesis testing and additional analysis, the project team was able to identify the source of the defects in the forklift fulfillment process. The significant contributors identified to the problem were:

- Vendor had inconsistent definition of serial number
- Your company had inconsistent definition of serial number
- Input process is manual
- Lag in receiving data



# Project Update

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## Quick Wins and Mistake Proofing

The team is ready to develop a strategy to improve. Some simple process changes could have a significant impact on the process performance.



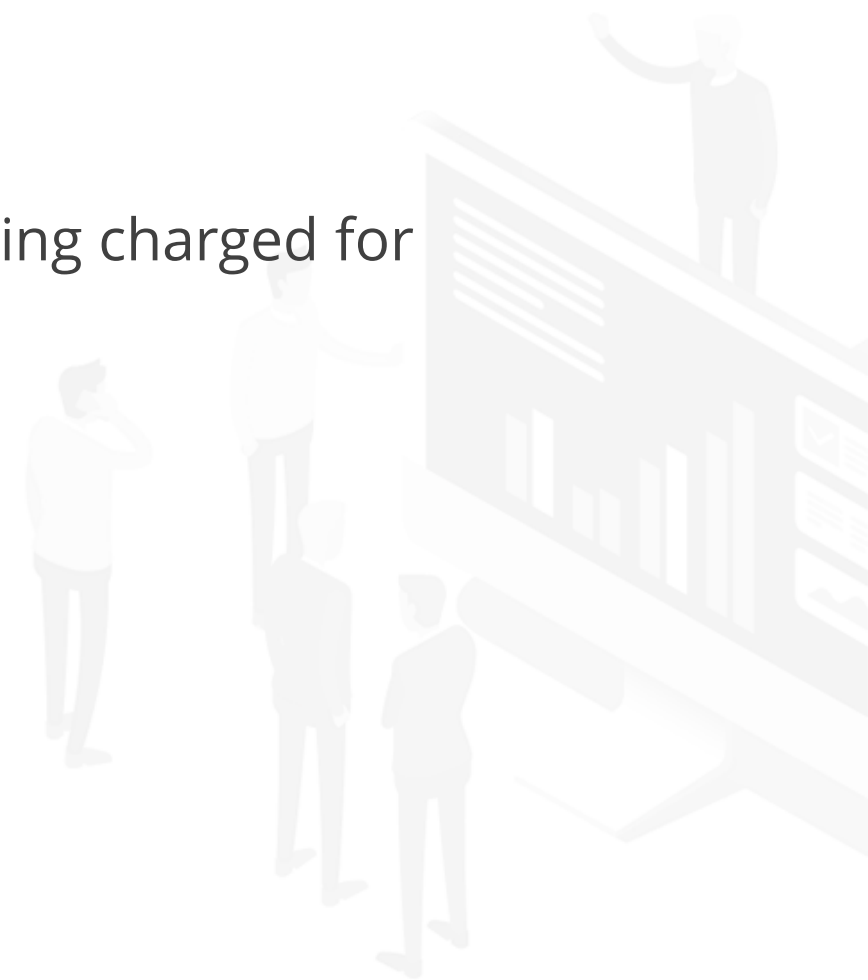
# Project Update

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## Potential Improvements

The team came up with a list of potential improvements to the forklift fulfillment process that could facilitate accurate forklift tracking. The team worked with vendors to ensure that each forklift had a unique serial number or identifier. Other improvements include:

- The elimination of time lag between vendors' records and the company records
- Creating a monthly expired forklift report to flag forklifts that the company is still being charged for although the lease has expired
- Implementing an audit process to find forklifts with non-matching serial numbers
- Changing the SOP to short-pay invoices for non-matching or expired forklifts





# Project Update

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## Verify Improvements

A key component of the Improve phase is the ability of the team to verify improvement success. After solutions are implemented for several weeks, your team collects data from the latest report. There were 5001 invoices and a total of 312 defects based on the team's defect definition.



# Improve Phase Questions

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1. What should be the outcomes of the Improve phase?
2. Based on the team's findings in the Analyze phase, what ideas for quick hit improvements or poke-yoke can the team come up with?
3. What type of graphical summaries can the team create to display the improvement impact?
4. What is the process sigma level on the new project data?
5. How does the new process performance compare to the baseline performance?





# Improve Phase Answers

1. The Improve phase should result in implemented solutions that have effectively improved performance.
2. A couple of quick wins include process automation and a more standardized serial number creation system.
3. To show process improvements in a graphical display, Control Charts, Trend Charts, and Box and Whiskers Plots could be used.
4. See improved Sigma Level calculation in the table below.
5. The new process Sigma Level of 3.035 shows an improvement from the previous 2.146 Sigma Level.

Step	Equation	Result
Determine number of defect opportunities per unit	O=	1
Determine number of units processed	N=	5001
Determine total number of defects made	D=	312
Calculate defects per opportunity	$DPO = D / (N \times O) =$	0.0623875
Calculate yield	$Yield = (1 - DPO) \times 100$	93.76
Sigma Level from Sigma conversion table	process sigma =	3.035