

Implementing Lean Six Sigma throughout the Supply Chain

The Comprehensive and
Transparent Case Study

Elizabeth A. Cudney • Rodney Kestle



CRC Press

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business
A PRODUCTIVITY PRESS BOOK

Contents

Acknowledgments	xi
Authors	xiii
1 Introduction	1
How To Use the CD	2
CD Instructions.....	2
2 Lean Six Sigma Overview.....	5
3 Case Study Introduction.....	11
4 Define Phase	15
Introduction	15
Midwest Logistics, Lean Six Sigma Core Team.....	16
Develop Initial Documents	19
Project Charter	20
Supplier–Input–Process–Output–Customer (SIPOC)	25
Identify Stakeholders and Develop Communication Plan.....	28
Communications Strategy List.....	32
Perform Initial VOC and Identify CTS	35
Select the Team and Launch the Project.....	39
Midwest Logistics, Lean Six Sigma Team Additions.....	40
Create Responsibility Matrix (RASIC).....	41
Create Project Plan.....	41

5 Measure Phase.....	55
Introduction	55
Define the Current Process	56
Process Mapping.....	64
Data Collection Plan, Metrics, and Operational Definitions ...	84
Create a Baseline	97
Define the Detailed Voice of the Customer (VOC)	101
Interview Event.....	101
Brainstorm Needs	104
Affinity Diagrams	105
Translate Needs to CTQ	108
Survey Customers/Stakeholders	115
Customer Needs Map	116
Quality Function Deployment (QFD)	138
Define the Voice of the Process (VOP) and Current Performance.....	139
Benchmarking	141
Check Sheets.....	141
Plots, Capability, and Statistics	148
Pareto Charts, Time Series, Histograms.....	149
Validate Measurement System	159
Define the Cost of Poor Quality (COPQ) and Cost/Benefit.....	164
Moving to the Analyze Phase.....	164
6 Analyze Phase	167
Introduction	167
Develop Cause-and-Effect Relationships.....	169
Test for Normality Exercise	172
Process Analysis and 8 Wastes.....	173
5S.....	176
Failure Mode and Effects Analysis	177

Determine and Validate Root Causes	181
Regression Analysis	196
Hypothesis Test.....	196
Develop Process Capability	196
Process Capability.....	199
7 Improve Phase.....	207
Introduction	207
Identify Breakthrough and Select Practical Approaches.....	208
Action (Pilot) Plan.....	210
Perform Cost/Benefit Analysis	211
Design Future State	212
Establish Performance Targets and Project Scorecard.....	214
Gain Approval to Implement, Then Implement.....	222
Train and Execute.....	222
8 Control Phase	231
Introduction	231
Measure Results and Manage Change	232
Report Scorecard Data and Create Process Control Plan.....	235
FMEA and Control Plan.....	235
Process Capability/DPMO	237
Apply P-D-C-A Process.....	240
Identify Replication Opportunities.....	242
Develop Future Plans	244
9 Conclusions	247
Lean Six Sigma Glossary	249
Index	261