

Lean Six Sigma Yellow Belt



Course eBook

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eBook Overview

Welcome to the eBook for the Acuity Institute Lean Six Sigma Yellow Belt Program.

- ✓ You will need the most recent version of **Adobe Reader** to view the eBook. We do not recommend viewing the eBook with Adobe Acrobat.
- ✓ We recommend becoming familiar with the eBook and its features. A few features include printing, viewing notes, and capturing your comments.
- ✓ For ease of use, we have included numerous bookmarks in the eBook so you can quickly access common course concepts.
- ✓ The eBook is for personal use only. Please do not use the eBook for presentations and training facilitation.
- ✓ The eBook is for the intended parties only.

Course Overview

Welcome to Lean Six Sigma Yellow Belt Training. This course has been designed to teach Lean Six Sigma fundamentals and its application. It is intended for improvement project team members.

The Lean Six Sigma Yellow Belt course materials includes 6 Lessons: Lean Six Sigma Introduction, Define Phase, Measure Phase, Analyze Phase, Improve Phase and Control Phase.

This course contains various exercises that are represented by the following icons:



General Exercises



Simco
International
Products
Simulated
Project

Simulated Project Overview

At Acuity Institute we recognize that not every individual has the opportunity to complete an actual Lean Six Sigma project while completing training, therefore we have created a real world simulated project that takes students from the beginning to the end of a problem and solution. The simulated project helps to build the students understanding of the concepts taught in training and provides practical application of the tools. Students complete the course better prepared to apply what they have learned in the real world.

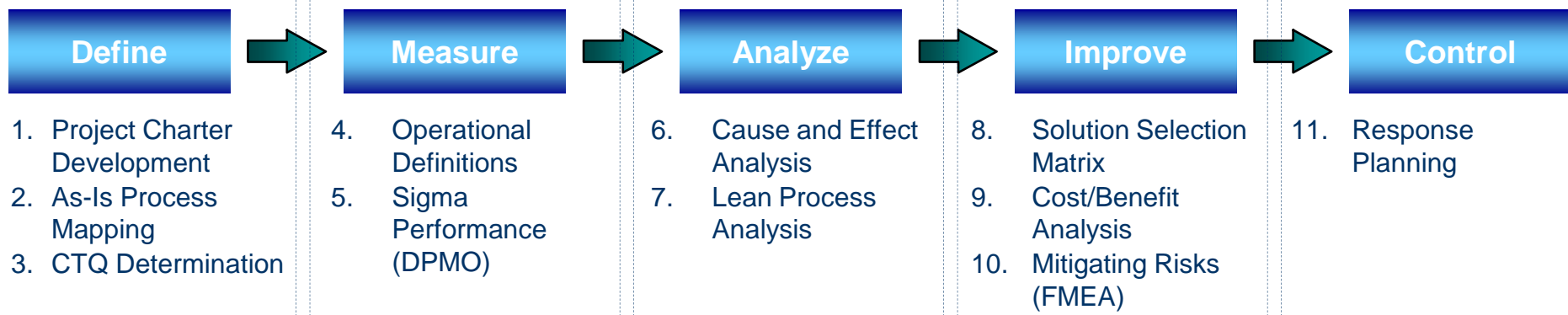
The simulation is based on a hypothetical company (Simco International or “SI”) that faces many of the same problems companies are dealing with today. The simulation is designed to illustrate the entire business improvement effort through every phase of the Lean Six Sigma DMAIC methodology. Students complete challenging exercises (project deliverables) which build on previously learned tools and concepts taught in training. When complete, students have a significant perspective on what true business improvement means and a tangible “project story” that they can utilize throughout their process improvement journey.

There is no comparison to Acuity Institute’s Simulated Project in the marketplace.

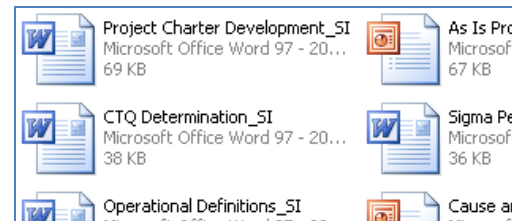
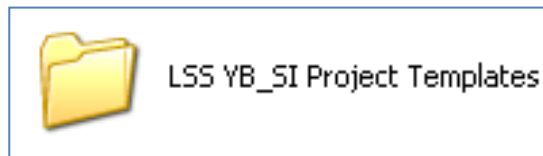
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Simulated Project Deliverables

Acuity Institute's Lean Six Sigma Yellow Belt Simulated Project includes 11 project deliverables which are introduced throughout the DMAIC Methodology.



There are “blank” templates for you to complete for all 11 Simulated Project deliverables. The templates are located in the “LSS YB_SI Project Templates” file folder. The templates are developed in common formats (MS Word, MS Excel, or MS PowerPoint). To access the templates you will need to download this file folder onto your computer.



For your reference, the name of the specific template that you are to complete is included in the instructions of the project deliverable you are working on (example: “SI Project Template: Project Charter Development_SI”). Please note, answers are provided as a reference point for many of the project deliverables. In most cases we do not recommend updating your answers to match the answers provided. It is important for your answers to be authentic to your experience as you complete the Simulated Project.

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Lean Six Sigma Toolkit



Template Name

The Lean Six Sigma Toolkit icon is periodically introduced in this course. The toolkit icon informs you that a Lean Six Sigma template is available for your use. The templates are located in the “Lean Six Sigma Toolkit Templates” folder. To access the templates you will need to download this folder onto your computer.

The Lean Six Sigma Toolkit assists practitioners in keeping focused on their project work and not creating “templates”. The toolkit includes common templates used throughout the Lean Six Sigma DMAIC phases. The templates are developed in common formats (MS Word, MS Excel or MS PowerPoint).

- ✓ Data Collection Plan
- ✓ DMAIC Tollgate Presentation
- ✓ FMEA
- ✓ Implementation Plan – Detailed
- ✓ Implementation Plan – High Level
- ✓ Process Monitoring Plan

Included Templates

- ✓ Process Value Analysis
- ✓ Project Charter
- ✓ Project Storyboard
- ✓ Quick Win Identification
- ✓ Response Plan

- ✓ Sigma Calculator
- ✓ SIPOC
- ✓ Solutions Selection Matrix
- ✓ Standardized Procedures
- ✓ Team Meeting Agenda
- ✓ Team Profile

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Lean Six Sigma Training



Lean Six Sigma Introduction

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Lean Six Sigma Training

Lean Six Sigma Overview

Lean Six Sigma Improvement Methodologies

Lean Six Sigma Roles

Vital Questions in an Increasingly Competitive World

Does your current performance meet customer expectations? Is there a gap between what your company's leaders want to achieve and the organization's ability to deliver it?

“Leaders who execute look for deviation from desired managerial tolerances – the gap between the desired and actual outcome in everything from profit margins to the selection of people for promotion... Like Six Sigma, the discipline of execution doesn't work unless people are schooled in it and practice it constantly... Execution has to be part of an organization's culture...”

-- Larry Bossidy, Former CEO of Allied Signal --

-- Execution: The Discipline of Getting Things Done --

Lean Six Sigma Definition

Lean Six Sigma was developed out of necessity as a very rigorous and disciplined approach for companies to improve products and services based on their customers' expectations and requirements...an "outside looking in" approach. Lean Six Sigma has many facets.



Lean Six Sigma can improve profits and cut costs, but more importantly, it can keep customers loyal as well as improve a company's competitive advantage.

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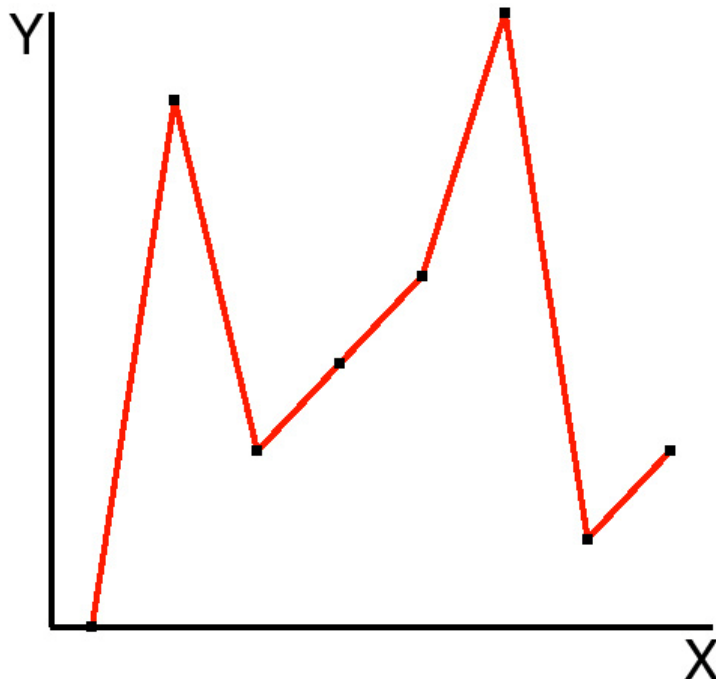
Lean Six Sigma Definition

Lean Six Sigma uses a variety of tools and techniques to achieve superior process performance, such as:

- ✓ Customer Surveying (Voice of Customer)
- ✓ Metric Identification and Collection
- ✓ Baselining / Measuring Process Performance
- ✓ Data Based Decision Making (Analysis and Statistics)
- ✓ Lean Process Flow / Value Analysis
- ✓ Benchmarking “Best In Class” Companies
- ✓ Risk Analysis / Assessment
- ✓ Implementation Planning / Management
- ✓ Change Management

The Focus of Lean Six Sigma

For every process there is a dependent variable called Y that we are attempting to influence. The independent variables which determine what happens to our Y are called the process X's. Thus, we can boil down every process into a simple formula:



$$Y = f(x^1, x^2, x^3 \dots x^n)$$

The goal of Lean Six Sigma is to understand the relationship between our various Xs and our Y, so we can manipulate the Xs to modify Y as desired, then lock down the process so that Y remains within the proper range and is meeting customer requirements.

Lean Six Sigma Focuses on Reducing Variation

Variation Happens

- ✓ All repetitive activities of a process have a certain amount of fluctuation or variation
- ✓ Variation is the “Voice of the Process”
- ✓ When plotted, process variation becomes visible over time
- ✓ Input, process, and output measures will have variation
- ✓ Failure to understand variation could be costly



Time

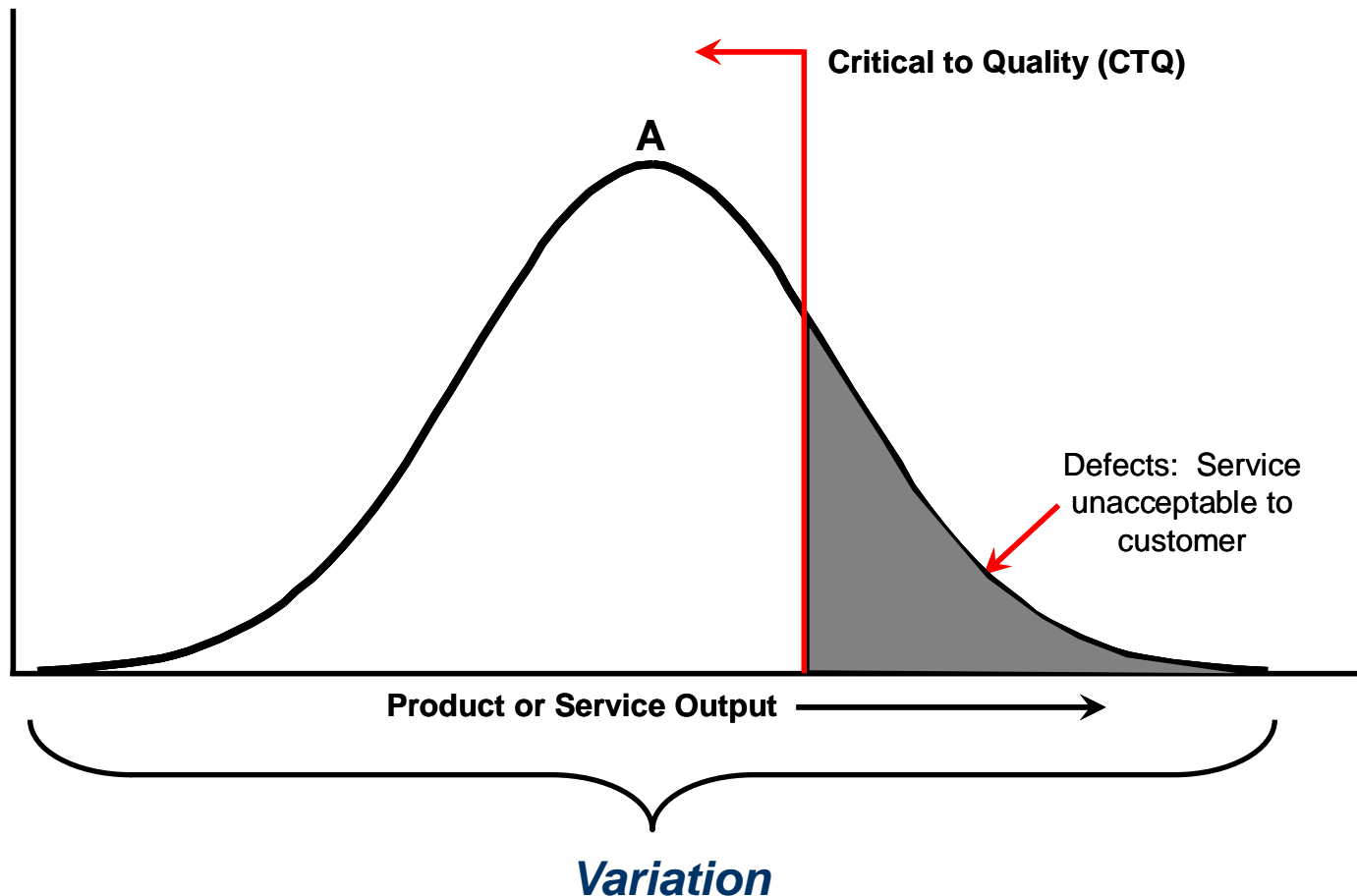


Frequency

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Why It's Important To Understand Variation

PROCESS VARIATION INHIBITS OUR ABILITY TO MEET CUSTOMER REQUIREMENTS



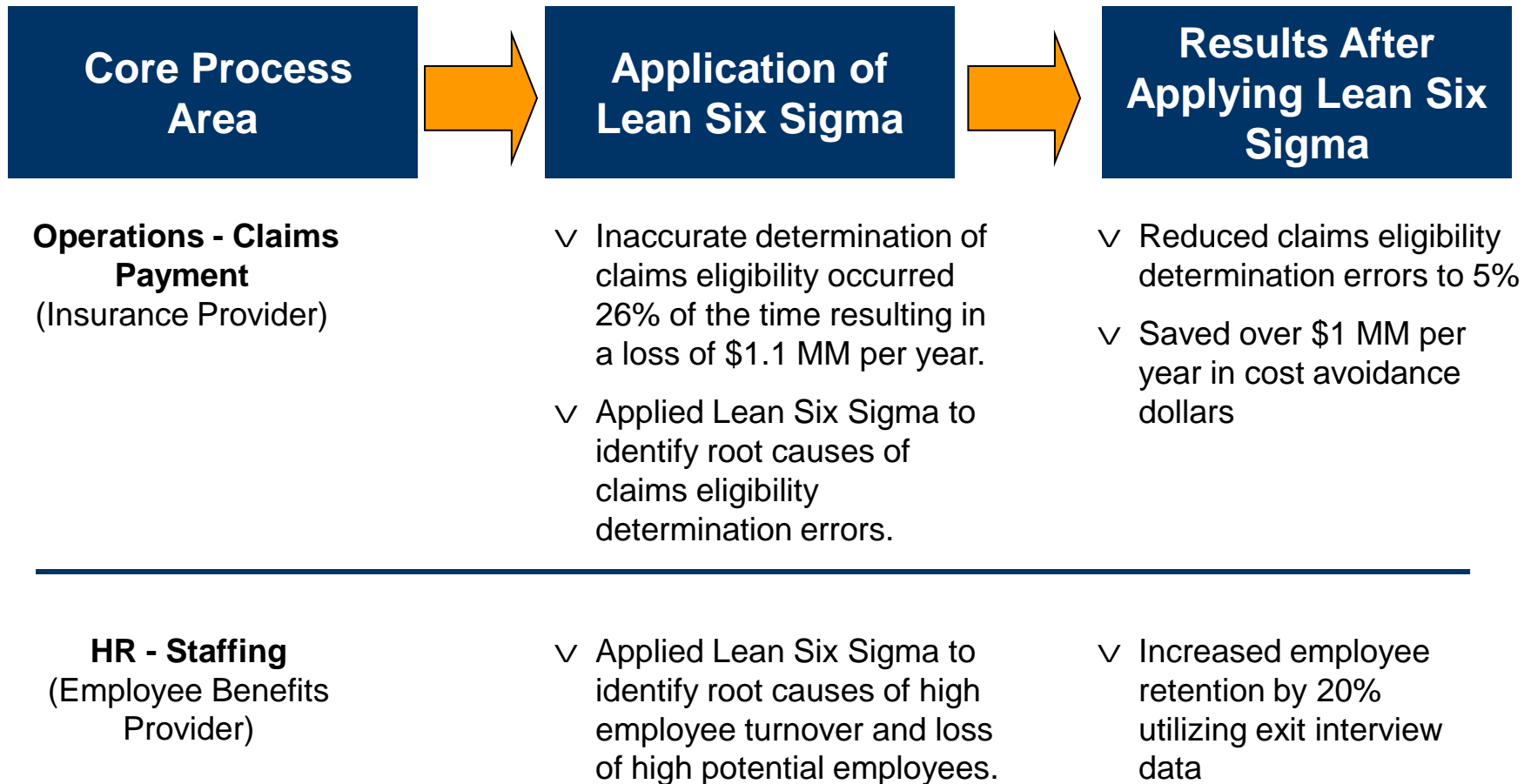
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Lean Six Sigma – What it Is and What it is Not

- ✓ Lean Six Sigma is a framework to improve performance
- ✓ Lean Six Sigma is not the solution for everything
- ✓ Lean Six Sigma does apply to every function and business
- ✓ Lean Six Sigma is not just about statistics
- ✓ Lean Six Sigma is about Business Performance
- ✓ Lean Six Sigma is not new work
- ✓ Lean Six Sigma is a better way to work

Applying Lean Six Sigma

Lean Six Sigma can be applied to any process problem to achieve significant improvement results. The following are a few examples.....



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Companies Deploying Lean Six Sigma (a sample)

Motorola

Dow

Jaguar

Allied Signal

IBM

Johnson & Johnson

Sony

American Express

Bank of America

Honda

General Electric

Nokia

Maytag

Lockheed Martin

Polaroid

Raytheon

Texas Instruments

Digital Electronics

Bombardier

DuPont

Kodak

Canon

Toshiba

Fidelity Investments

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Lean Six Sigma Training

Lean Six Sigma Overview

Lean Six Sigma Improvement Methodologies

Lean Six Sigma Roles

Types of Improvement Methodologies



Process Management

- Process performance is unknown or not understood
- Implement a process monitoring dashboard to decide what to do next

Just Do It

- Problem identified and solution is known
- Implement a fix and establish a dashboard to continuously monitor process

Kaizen

- Problem identified and solution is unknown.
- Small in scale or urgency needed for process improvement
- Initiate 2-5 day Kaizen Event to analyze the process and implement improvements

Lean

- Process is inefficient and contains wasteful activities
- Initiate a Lean project to identify non value-add activities and remove waste from the process

DMAIC

- Existing process is not meeting customer requirements or business objectives
- Initiate a DMAIC project to identify root causes of the problem and initiate breakthrough improvements

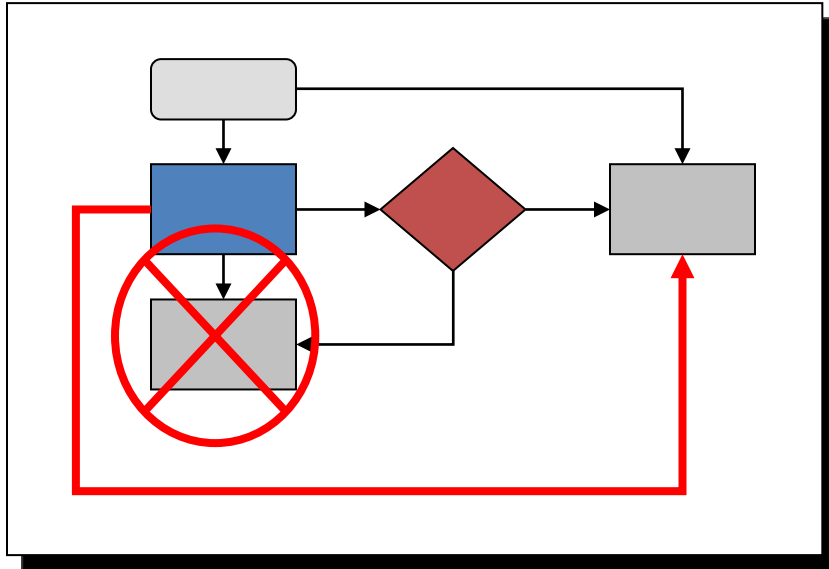
DFLSS

- New product or process needs to be designed or significant problems to current process exist
- Initiate DFLSS project to design processes to meet customer requirements

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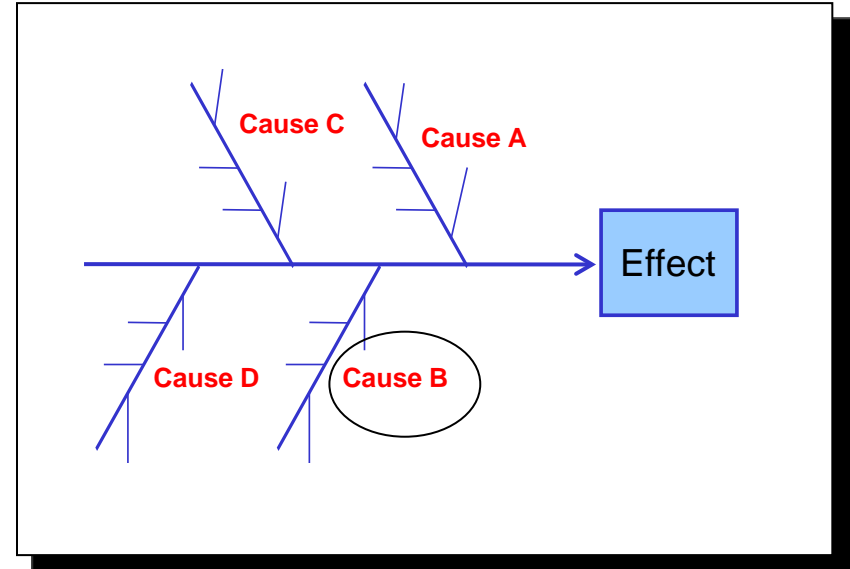
Improvement Techniques – Lean and Six Sigma

Lean



Efficiency
Improvement

Six Sigma

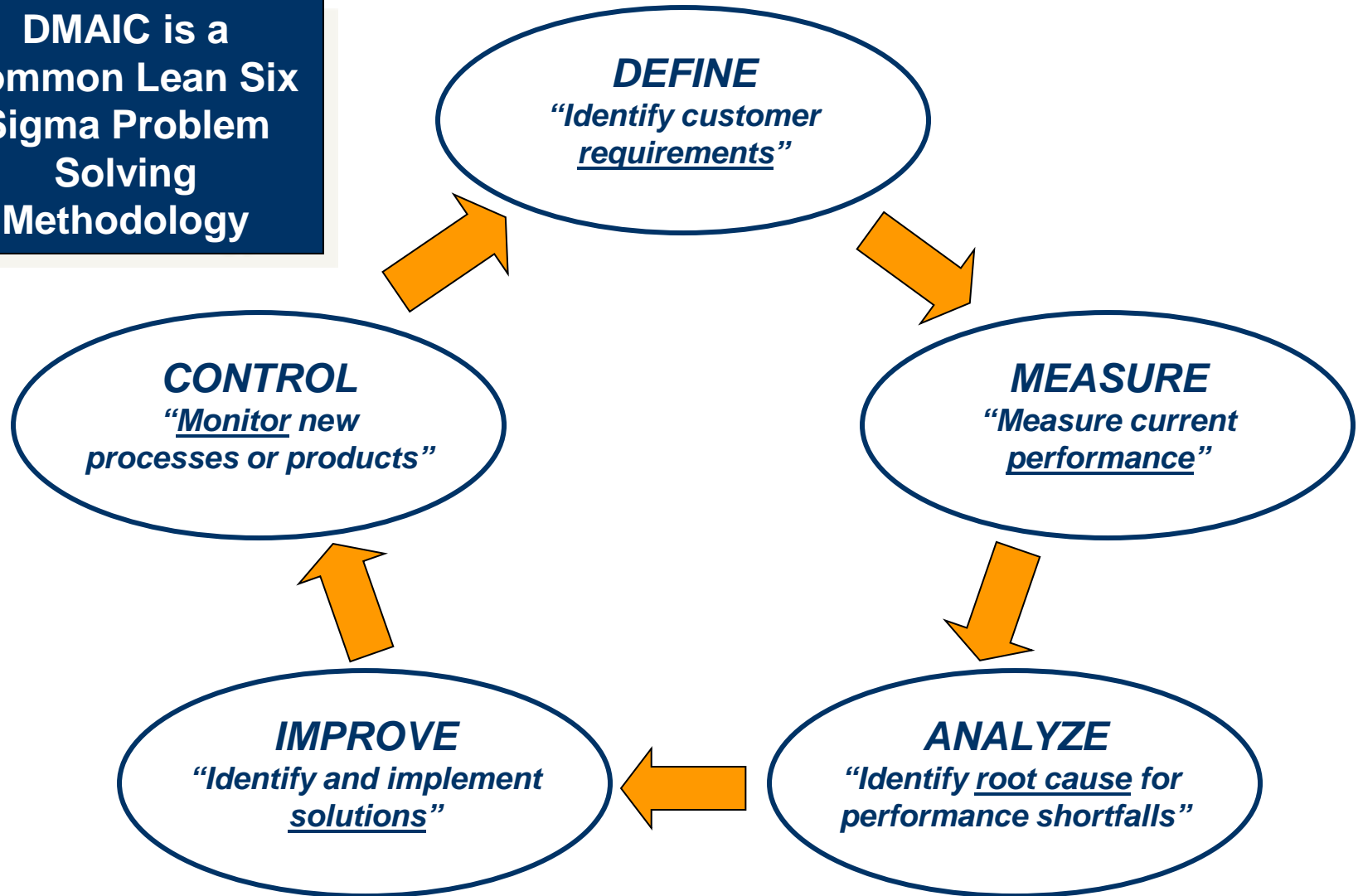


Quality and Efficiency
Improvement

Combining Lean and Six Sigma is Best in Class

Lean Six Sigma DMAIC Methodology Defined

**DMAIC is a
Common Lean Six
Sigma Problem
Solving
Methodology**



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Key DMAIC Project Deliverables

Define

Measure

Analyze

Improve

Control

- q Project Charter
- q Project Management
 - q Project Plan
- q Process Definition
 - q SIPOC
 - q As-Is Process Map
 - q Quick Win Identification
- q Stakeholder Management
 - q Stakeholder Map
 - q Stakeholder Management Plan
 - q Communication Plan
- q Voice of Customer
 - q Customer Identification
 - q VOC Research Plan
 - q Kano Analysis
 - q CTQ Identification

- q Identify Measures
 - q X/Y Matrix
- q Data Collection
 - q Operational Definitions
 - q Measurement Systems Analysis (MSA)
 - q Data Collection Plan
- q Describe and Display Data
 - q Histogram
 - q Pareto Chart
 - q Pie Chart
 - q Run Chart
 - q Control Charts
- q Baseline Performance
 - q Sigma Performance
 - q Yield
 - q Process Capability
- q Quick Win Identification

- q Root Cause Analysis
 - q Affinity Diagram
 - q Fishbone Diagram and/or 5 Why's
- q Lean Process Analysis
 - q Lean Tools and Measures
- q Graphical Data Analysis
 - q Histogram
 - q Pareto Chart
 - q Box Plots
 - q Correlation Analysis
- q Statistical Data Analysis
 - q Linear Regression
 - q Multiple Regression
- q Root Causes Identified
- q Quick Win Identification

- q Identify and Select Solutions
 - q Generate Solutions
 - q Benchmarking
 - q Solutions Prioritization Matrix
 - q Solution Selection Matrix
 - q To-Be Process Map
- q Financial Impact of Solutions
 - q Cost/Benefit Analysis
- q Risk Planning and Testing
 - q Failure Modes and Effects Analysis (FMEA)
 - q Pilot Plan
- q Implement Solutions
 - q Multi-Generational Project Plan (MGPP)
 - q Implementation Plan
 - q Stakeholder Management
 - q Project Storyboard

- q Process Control
 - q Control Charts
 - q Process Monitoring Plan
 - q Dashboard
- q Response Plan
- q Project Documentation
 - q Process Procedures
 - q Replication Opportunities
 - q Solution Transfer Plan

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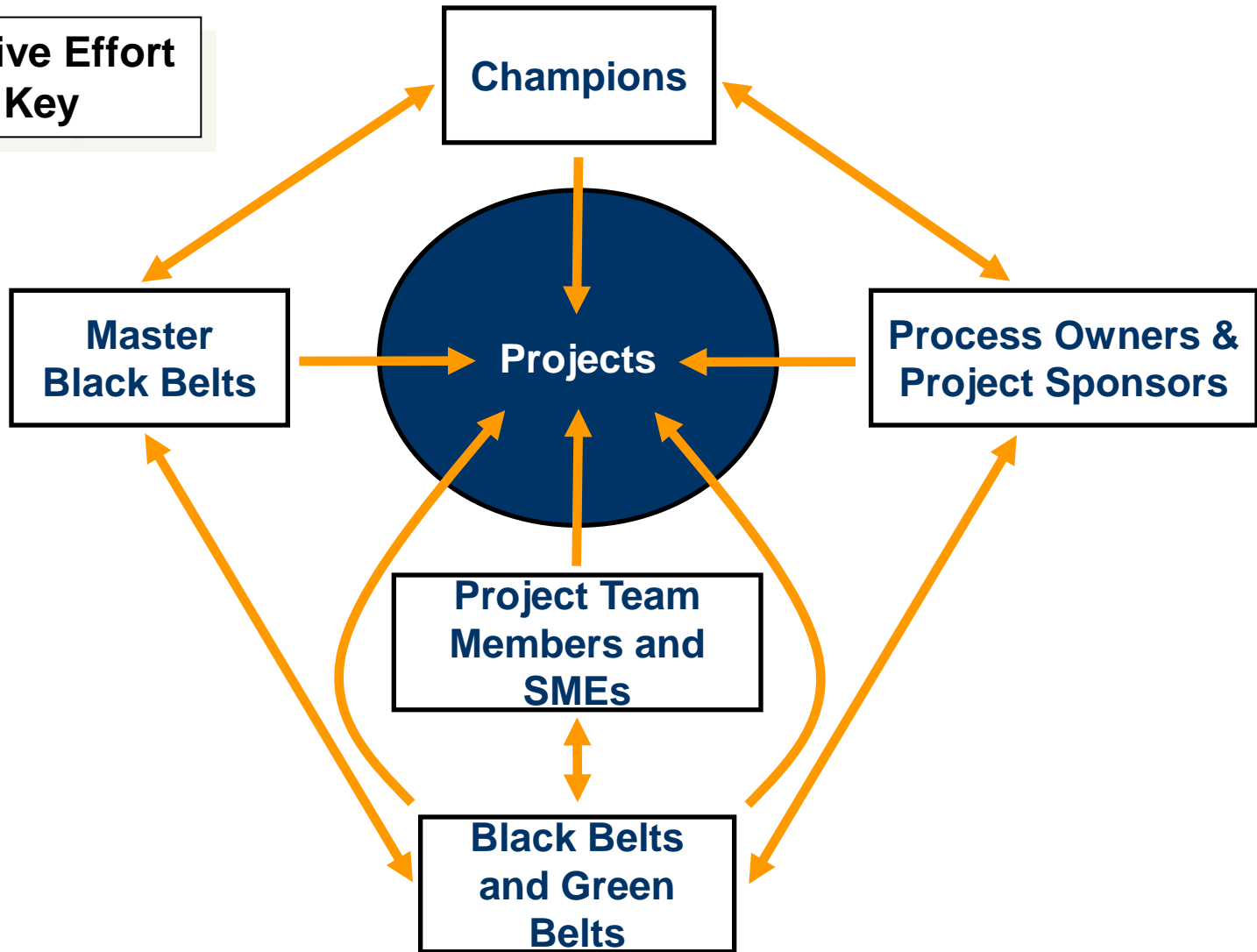
Lean Six Sigma Overview

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**Collaborative Effort
is the Key**



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Champions / Executive Leadership

- ✓ Monitors the external and internal factors affecting the business
- ✓ Defines business strategy
- ✓ Communicates the plan for business success
- ✓ Champions Lean Six Sigma vision
- ✓ Establishes improvement priorities and targets
- ✓ Provides and aligns resources (Sponsors, Black Belts / Green Belts), ensures cross-functional collaboration
- ✓ Establishes accountability for results
- ✓ Role modeling appropriate behaviors, change leader
- ✓ Integrates Lean Six Sigma into business direction & plan
- ✓ Markets Lean Six Sigma program and results

Process Owners

- ✓ Assists in identifying potential Lean Six Sigma projects
- ✓ Approves and supports projects
- ✓ Provides resources to serve as team members and subject matter experts (SMEs) on projects
- ✓ Approves changes in project scope and removes barriers
- ✓ Owns the solution delivered by the project team
- ✓ Responsible for supporting implementation of improvement actions

Project Sponsors

- ✓ Provides and aligns resources (Black Belts / Green Belts, Team Members), ensures cross-functional collaboration
- ✓ Establishes improvement priorities, targets and accountability for results
- ✓ Role modeling appropriate behaviors, change leader
- ✓ Ensures project is aligned with department and strategic objectives
- ✓ Approves all phases of Lean Six Sigma projects
- ✓ Ensures project deliverables are being maintained and project is on time and on budget
- ✓ Approves changes in scope of the project, removes barriers
- ✓ Markets Lean Six Sigma program and results

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