



Diagnostic Practices

Training Program Brochure

Program Introduction

In its purest form, Lean Six Sigma is about leveraging the principles and tools of science to abate business risk – at all levels of an enterprise. With this in mind, we can view the practice of Lean Six Sigma (LSS) from four different altitudes. At its highest level, LSS is a strategic vision that epitomizes business success. Second, it is a tactical system of project management that optimizes the control function of a commercial or industrial enterprise.

Third, it's a scientific approach for minimizing or eliminating certain forms of business risk commonly associated with the operation of critical processes. Fourth, it is a personal way of thinking that unites the power of deductive reasoning with the benefits commonly associated with data-driven decision making.

Program Rationale

Today, more than ever before, organizations of all types are questing for top and bottom line improvement. This journey is no longer considered a side-bar activity; rather, it is now viewed as a critical business imperative. Of course, this means that business executives must find new and innovative ways to reduce their total cost structure, improve capability and increase capacity, but done so without capital investment. These executives also understand that, to achieve this mission, they must improve their core processes, yet done so in an economical, repeatable and verifiable way. Naturally, the realization of this grand vision requires individuals that have the capability to yield beneficial change in a relatively short period of time. When leaders of this calibre are enabled by the power of Lean Six Sigma, quantum business improvements are not only possible, but highly probable.

Program Description

The SSMI® Diagnostic Practices Training program will endow the participant with the knowledge and insights necessary to judiciously plan and successfully execute a diagnostic study. Participants will learn how to fully characterize the statistical performance of a process and identify the dominant families of variation.

Students will discover a selected array of powerful analytical and statistical tools that are essential for isolating critical sources of variation related to process centering and spread. Major emphasis is given to the methods and techniques for statistically analyzing, describing, and displaying performance data for virtually all types of products, processes, services and transactions. In particular, the participant will learn how to select the right variables and parameters for inclusion in a factorial experiment. Participants will learn how to establish operating tolerances for almost any type of product, process or service.

Of special interest, the participant will learn the theory and application of common sampling methods as well as how to draw valid conclusions and make statistical inferences from a sampling distribution. In support of this, the participant will also learn how to draw such conclusions with known degrees of statistical risk and confidence. The knowledge gained from this curriculum is paramount to the effective use of performance metrics and indices of process capability. Reinforcement of the major techniques and applications is realized through exercises, scenarios, and case studies.



Target Audience

This program of study has been designed for individual contributors and managers seeking vertical mobility or pursuing horizontal opportunities within their respective fields of practice. The successful candidate enjoys working with data and solving problems, as well as working in a project-based, team-oriented environment. Basic arithmetic and computer skills are essential. In this context, a rudimentary understanding of Excel is highly recommended, but not essential. Furthermore, a most rudimentary understanding of algebra is a plus, but not required. Generally speaking, the successful completion of any undergraduate degree program will likely support the academic demands of this program.

Program Goals

Upon completion of this program of study, the candidate will be able to successfully:

- Understand the Six Sigma DMAIC methodology and the supporting set of basic analytical tools
- Apply Lean Six Sigma knowledge and diagnostic skills in support of work – team goals, objectives and tasks
- Utilize advanced process diagnostic principles and practices to better frame and solve daily problems

Program Focus

The Diagnostic Practices program of study will focus on several key areas:

- *Six Sigma principles, practices, deployment strategies and implementation tactics.*
- *Basic statistics, benchmarking methods, process control techniques, process diagnostic methods and variable research methods.*
- *Types and uses of performance data, sampling schemes and data collection.*
- *Project success criteria, charter elements, execution milestones and review guidelines.*
- *Principles and practices associated with process characterization and optimization.*



Who is the Six Sigma Management Institute

The Six Sigma Management Institute was founded by Dr. Mikel J. Harry, the co-creator of the Six Sigma methodology. For over 20 years, we have coached hundreds of companies and trained thousands of individuals both with goal of helping them achieve the highest level of performance in their industries and professional careers. During these highly complex and data-driven times, we believe than every individual should be knowledgeable of the frameworks and the tools required to dive deep into data and re-emerge with valuable information, to help their company and themselves achieve breakthrough improvements. SSMI's mission is to provide the necessary frameworks and tools to enable any company enhancing the quality of their products, services and ultimately to increase the satisfaction of their clients.

Program Architect

Dr. Harry has been widely recognized as one of the original architects and pioneer of Six Sigma inside Motorola at which he was responsible for the research and development of advanced engineering and statistical models. All the training offered by SSMI are the result of 30 years of application of these models. Even though many companies worldwide now offer Lean and Six Sigma trainings, SSMI is the only Institute in the world to possess the original material and framework which made this methodology one of the most successful and powerful in the world.



Certification Path

In order to obtain the SSMI® Diagnostic Practices Certification each and every candidate must complete the following steps:



Online Self – Paced or Class Training

The total instructional time for the SSMI® Diagnostic Practices is 7 days (classroom) or 60 hours (online). Of course, for the online format participants can take the time they need and set their own schedule.

Knowledge Assessment Exams

Completion of 11 Knowledge Assessments Exams. Each module assessment comprises of 6 to 102 questions which participants need to score more than 70%

SSMI International Certification

Upon the completion of every requirement the candidate will receive the certificate for the SSMI® Diagnostic Practices Training Program.



Program Modules

The body of knowledge associated with this program of study has been configured to develop solid process diagnostic skills that underpins the successful practice of Lean Six Sigma. The topics are defined by competency based training modules, where each module is comprised of instructional steps. Segment and topic titles are as follows:

Training Orientation

- Excel Orientation
- Statistical Software Orientation
- Simulator Orientation

1. Breakthrough Vision

- Deterministic Reasoning
- Leverage Principle

2. Process Management

- Performance Yield
- Hidden Processes
- Measurement Power
- Establishing Baselines
- Defect Opportunity
- Process Models
- Process Capability
- Design Complexity

3. Quality Tools

- Variable Classifications
- Measurement Scales
- Problem Definition
- Focused Brainstorming
- Process Mapping
- SIPOC Diagram
- Force – Field Analysis
- Matrix Analysis
- C&E Analysis
- Failure Mode Analysis
- Performance Sampling
- Check Sheets
- Analytical Charts
- Pareto Charts
- Run Charts
- Multi – Vari Charts
- Correlation Charts
- Frequency Tables
- Performance Histograms
- Basic Probability
- Pre-Control Charts
- Control Charts
- Score Cards
- Search Patterns

- Concept Integration
- Quality Simulation

4. Basic Statistics

- Performance Variables
- Statistical Notation
- Performance Variation
- Normal Distribution
- Distribution Analysis
- Location Indices
- Dispersion Indices
- Quadratic Deviations
- Variation Coefficient
- Deviation Freedom
- Standard Transform
- Standard Z - Probability
- Central Limit
- Standard Error
- Student's Distribution
- Standard T - Probability
- Statistics Simulation

5. Hypothesis Testing

- Statistical Inferences
- Statistical Questions
- Statistical Problems
- Null Hypotheses
- Alternate Hypotheses
- Statistical Significance
- Alpha Risk
- Beta Risk
- Criterion Differences
- Decision Scenarios
- Sample Size

6. Confidence Intervals

- Mean Distribution
- Mean Interval
- Variance Distribution
- Variance Interval
- Proportion Distribution
- Proportion Interval
- Frequency Interval

7. Parametric Methods

- Mean Differences
- Variance Differences
- Variation Total
- Variation Within
- Variation Between
- Variation Analysis
- One – Way Anova
- Two – Way Anova
- N – Way Anova
- ANOVA Graphs
- Linear Regression
- Multiple Regression
- Residual Analysis
- Parametric Simulation

8. Chi – Square Methods

- Statistical Definition
- Model Fitting
- Testing Independence
- Contingency Coefficients
- Yates Correction
- Testing Proportions

9. Survey Methods

- Research Design
- Information Sources
- Questionnaire Construction
- Formulating Questions
- Question Quality
- Sampling Plans
- Data Analysis

10. Nonparametric Methods

- Nonparametric Concepts
- Median Test
- Runs Test
- Other Tests

11. Measurement Analysis

- Measurement Uncertainty
- Measurement Components
- Measurement Studies



Benefits of an SSMI® Lean Six Sigma Certification



Better Execution

Six Sigma links strategic initiatives to operational improvements to create efficiencies for your business.



Build Customer loyalty

Six Sigma helps to target your customer needs so you can improve the things that matter most to your customers.



Create Greater Returns

Six Sigma helps to lower the operational costs and reduce the turnaround time in delivery of products and services to bring about higher customer satisfaction.



Certifies your Talent

A Lean Six Sigma Certification is the proof that you have the experience and skills to deliver quality service that matches customer expectations.



Improves your work performance

Professionals with Lean Six Sigma skills earn close to \$120,000 with global opportunities.



Opens Doors

A Lean Six Sigma credential can get you access to globally renowned companies of your choice.



Applies Everywhere

Six Sigma Certifications are based on achieving excellence while providing quality services. The concepts and techniques can be adapted to any real-world challenge across industries, market segments and geographies.

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