

Experimental 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® Experimental Practices Training Program provides the participant with the fundamental tools and procedures required to fully comprehend and capitalize on the training of experimental design, commonly referred to as Design of Experiments or simply DOE. This program will arm the participant with the insights necessary to plan, execute, analyze, interpret and report the results of statistically designed experiments as well as how the application of a statistically designed experiment can be used to establish the optimum operating conditions for one or more input variables.

Participants will learn how to translate a practical problem into a statistical problem and then isolate simple and complex cause-and-effect relationships which often remain undetected with traditional problem-solving methods. Students will learn how to depict and communicate the results of a statistics-based experiment in down-to-earth language. The instructional content also provides the participant with helpful insights, short-cuts, and tips on how to establish a post-experiment action plan.

In addition, a primary focus is placed on the key design principles, primary methods of data analysis, and powerful graphical procedures that drive success. From here, the participant is fully prepared to move on to more advanced experimental methods and statistical procedures. Reinforcement of major concepts, techniques, and applications is realized through exercises, scenarios, case studies, and field 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 basic Lean Six Sigma knowledge and process design skills in support of work – team goals, objectives and tasks
- Utilize advanced process design principles and practices to better frame and solve daily problems

Program Focus

The Experimental 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 design 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.

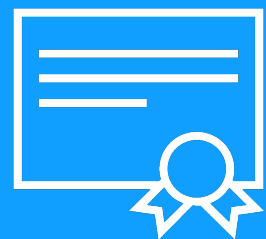
Program Architect

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® Experimental Practices Certification each and every candidate must complete the following steps:



Online Self – Paced or Class Training

The total instructional time for the SSMI® Experimental 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 9 Knowledge Assessments Exams. Each module assessment comprises of 6 to 70 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® Experimental Practices Training Program.



Program Modules

The body of knowledge associated with this program of study has been configured to develop solid process design 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
- Matrix Analysis
- C&E Analysis
- Performance Sampling
- Check Sheets
- Analytical Charts
- Pareto Charts
- Run Charts
- Correlation Charts
- Frequency Tables
- Performance Histograms
- Basic Probability
- 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. Experimental Methods

- Design Principles
- Design Models
- Experimental Strategies
- Experimental Effects
- One - Factor Two Level
- One - Factor Multi Level
- Full Factorials
- Two - Factor Two Level
- Two - Factor Multi Level
- Three - Factor Two Level
- Planning Experiments
- Fractional Factorials
- Four - Factor Two Level
- Five - Factor Two Level
- Screening Designs
- Robust Designs
- Experiment Simulation

9. 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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