SANDHOLM EXCELLENCE CENTER

Training and consulting in quality management, excellence and continual improvements since 1971.

Lean Six Sigma Green Belt training

An education program about Lean Six Sigma methods and tools that give results

This program introduces the many methods and tools that are essential to obtaining conclusive results when solving problems and working with continual improvements in Lean Six Sigma Green Belt projects. There is an emphasis on practical applications and how to achieve good results. The main objective is problem solving and process development in both manufacturing and service processes. What the participants learn is also suitable for basic problem solving in other improvement concepts such as Lean, TQM and Kaizen.

When working with systematic problem solving and continual improvements, there are some essential steps: collect and analyze facts about the organization to find areas for improvement, select and prioritize improvement projects, define and limit problems, identify root causes, find and implement solutions, follow-up improvements etc. To do this successfully it is important to have a solid knowledge base of problem-solving methods and QC-tools.

All processes contain important aspects that can be measured. Effective improvement work should be based on facts. To be able to so it is important to have a good knowledge of methods for statistical process analysis. The methods covered in this course can be used to detect any special causes of variation and predict/prevent unwanted behaviour in the process.

Important is also to understand how to develop a process that creates customer value in an effective and efficient way. By learning the tools and methodology of Lean, a breakthrough in thinking and results can often happen.

Purpose
To provide the knowledge and ability to apply effective methods and tools used in continual improvements and problem solving. Further, you will gain the knowledge and ability to apply these methods and tools effectively which lead to substantial improvements in profitability, cost efficiency, and customer satisfaction.

After completion of the course, participants will be able to analyse and improve process output more effectively. The course offers a Lean Six Sigma Green Belt diploma.

Aimed at
Persons that take part in, or will take part in, improvement teams or problem solving Lean Six Sigma Green Belt projects.

General information
Parallel to the Lean Six Sigma Green Belt training program the participants apply the knowledge learned in an improvement project in their own organization.

Many analyses are done using the software Minitab.

The lectures will be led by consultants from Sandholm Associates and given in English.

If you later want to upgrade to Lean Six Sigma Black Belt level, just contact us for a specific upgradation training program.

Documentation
Participants will receive relevant course material which will serve as a useful reference after the course.

Length
12 days (4 days in 3 modules)

Place
The course is given in a training building in the area of Ponte de Lima in northern Portugal or company internal at your site.

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CONTENT ➜ **Main parts of the *Lean Six Sigma Green Belt training course*:**

- Quality, customer focus and business development
- Introduction to Six Sigma and Lean
- Identifying improvement opportunities and selecting projects
- Organization, roles and responsibilities for improvement work
- Methods for problem solving - DMAIC
- Basic project management for improvement projects
- Define a problem and set a scope
- Identifying a business case
- Customer and process perspective on improvements
- Measure and understand the problem
- Root cause analysis and techniques for solving problems

- QC-tools
- Implementation of solutions
- Controlling and follow-up improvements
- Introduction to statistical analysis
- Understanding variations
- Practical statistics
- Control charts
- Capability studies
- Understanding Lean and Lean principals
- Analysing processes and value streams
- Elimination of waste, balancing a process and reduction of change over time
- Implementation of pull system
- Standardized work and Jidoka with Five S, TPM and Andon

Course schedule – Lean Six Sigma Green Belt training

Module 1 (4 days) – Introduction to Lean Six Sigma, DMAIC and basic problem solving

We start with an introduction to Six Sigma and Lean where we focus on how a successful improvement program should be run. We learn about organization, roles, and responsibilities of improvement work. Methodology and strategies for identifying and prioritizing good improvement projects are discussed. During this module we focus on Six Sigma's problem-solving model DMAIC. We start by learning how to define, scope, and limit a problem, how to develop a business case, how to identify customer needs, and how to study problem-related processes with SIPOC (Suppliers, Inputs, Outputs, Customers). We also discuss basic project management, with focus on leading and planning improvement projects.

We proceed to the Measure phase of the DMAIC-model and show how to identify critical measurable variables, design a measuring system, plan the measuring work, and perform measuring. Then we learn problem solving methodology and cover the Analyse phase. We focus on basic problem solving and root cause analysis. In this work we introduce many of the basic problem-solving tools. We also discuss other problem-solving strategies such as innovative problem solving and techniques to solve human controllable failures.

During this module we also focus on the Improvement phase of the DMAIC-model and learn how to implement solutions and take action. Finally, the participants learn the Control phase and we discuss how to ensure and maintain implemented solutions and how to follow up, report and communicate final results of the improvement project. As a part of this module, participants also identify and defining their proposed training projects.

Module 2 (4 days) – Understanding variations and using basic statistical analysis

During this module we start to learn statistical methodology, which will we will build on throughout the course. In this module, participants learn basic statistical theory and create an understanding of how common and special causes of variations affect the result of a process. The software Minitab is introduced, and we cover normal probability, control charts for individuals, estimates, and stages. The new knowledge is applied in real, case-based assignments. We continue and introduce more advanced knowledge about control charts. Participants learn to use I-mR and Xbar-R diagrams and discuss how to ensure that a process will meet actual demands. Methodology used to analyse process output and capability is presented, and Cp and Cpk are introduced.

We proceed to learn about confidence intervals, a tool later used to understand hypothesis testing and regression. We also explore different normal probability tests and methods for graphical summary and discuss how to deal with and understand data that is not in normal distribution. We cover the advantages and disadvantages of aggregated data, and introduce the Pareto diagram.

Module 3 (4 days) – Process improvements and Lean principles

In this module we initially discuss how to integrate Six Sigma and Lean in an effective improvement program. Focus is now on running improvements on process level and learning how to develop an effective and efficient flow that delivers value to the customers of the process. To understand Lean the participants do a Lean simulation where many of the principles of Lean are tested.

We then introduce the tools needed to analyse and understand the actual situation in a process. Focus is on tools such as gemba walks, spaghetti diagrams, flow charts, matrix diagrams and value stream mapping. We also discuss how to use technical devices to record information and analyse processes. Participants learn how to measure and analyse time in a process and how to identify bottle necks and use the theory of constraints.

In this module we also focus on how to develop a new future flow in a process by developing its ability to deliver customer value and eliminate waste. Participants learn how to create a continuous and balanced process flow and implement takt time. We also discuss the principles of a pull system and how lot size affect the flow. Focus is then on reduction of change over time and the SMED-method is introduced.

The participants also learn how to develop a systematic process approach by introducing standardized work and design work in an effective way. The Jidoka concept is introduced and we discuss how error proofing by Poka Yoke can be introduced in a process to avoid failures. Techniques for establishing good housekeeping with Five S are introduced and the use of Total Productive Maintenance (TPM) to avoid stops is discussed. We also learn how to design an early warning Andon system that helps to keep an undisturbed process flow. In this module participants study how to use Kaizen activities to maintenance and further develop a Lean based production system.

In this module we also continue the work with the training projects and prepare participants for a final on-line presentation.