

## Lean Sigma Green Belt Program - 5 Day Training

### Background:

In the current environment, companies need to be relentless in their efforts to eliminate waste from their businesses. Increasingly, the Lean systems approach is being adopted as the means of achieving this, with its focus on optimising customer value across the whole end-to-end business, and its ability to transform the business by exposing and eliminating waste.

An element of this waste lies in process variation, which results in defects and adversely impacts quality and other business performance areas. Six Sigma, with its formal structure and tool set, has long been recognised as a powerful, customer-focused methodology to attack this variation.

To a greater extent the key elements of these approaches are being combined, and together as Lean Sigma – the marriage of process improvement with system thinking – the fusion is proving to be more powerful than the individual parts. With Lean thinking guiding the way and driving optimisation at the system level, and Six Sigma driving excellence at the process level, a holistic solution to business competitiveness driving exceptional customer experience and business performance can be envisaged.

### Lean Sigma Content overview:

This highly intensive 5 day program is uniquely developed to marry the key aspects of Lean and Six Sigma, demonstrating the relationship and pointing the way as to how they can complement each other as Lean Sigma. The program covers the key concepts of Lean Thinking (Value, Value Stream, Flow, Pull and Perfection), bringing a practical understanding of how to identify and expose the opportunities presented by the ubiquity of waste in businesses and delivers practical instruction in powerful Lean tools & techniques such as Value Stream Mapping and Kaizen. Blended with this, the program provides instruction on primary Six Sigma concepts such as variation and process capability and incorporates the problem solving and process improvement techniques associated with the Six Sigma framework known as DMAIC (Define, Measure, Analyse, Improve, Control). Key Lean approaches such as 5S and Visual Management are incorporated in this framework which also includes a number of non-statistical problem solving tools that can be used immediately to discover the root cause of defects and other problems.

**Details:**

**Who should attend:**

This course is suitable for anyone seeking detailed exposure to Lean and Six Sigma methodologies and is ideal for anyone who desires or is required to play a lead role in continuous business improvement. It is typically of interest to Supervisors, Managers, Engineers, project leads and change agents driving or seeking to drive continuous improvements efforts leading to higher profitability, lower costs and higher customer satisfaction within their organisations.

**Venue:**

Lean Business Systems, Innovation Works, National Technological Park, Castletroy, Limerick

**Duration:**

5 days: 10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> May

**Cost:**

Full 5 day program: €1250. Please enquire about funding.

**Booking:**

Fully refundable booking deposit 50%. Full payment is required in advance of course commencement.

**Award:**

Lean Sigma Green Belt Program certificate of completion awarded by Lean Business Systems.

**Content outline:**

Lean Sigma Green Belt	Training Hours
Lean Sigma overview Fundamentals of Lean Introduction to Six Sigma	8
Takt time & Cycle time Value Stream Mapping Quick Changeover Kanban	8
DMAIC: "Define" Phase A3 methodology DMAIC: "Measure" Phase	8
Standard Work DMAIC: "Analyse" Phase 5S Visual management	8
DMAIC: "Improve" Phase Kaizen DMAIC: "Control" Phase TPM & OEE	8
<b>Total:</b>	<b>40</b>

## **Module Descriptors:**

### **Lean Sigma overview**

The Lean Sigma overview module is designed to provide a clear context and conceptual framework for the integrated application of Lean and Six Sigma tools and methodologies. The module identifies the core concepts of Lean and Six Sigma, demonstrating the criticality of an effective relationship between the two in arriving at an optimised approach to continuous improvement. It provides an overview of scope by describing the “landscape” of Lean Sigma which provides a foundation for following modules.

### **Six Sigma overview**

This module is designed to provide an introductory overview of Six Sigma. It takes the participant through the high level concepts involved, describing the statistical provenance of the approach, the DMAIC methodology at its core and the Management System aspects. It specifically introduces the idea of Variation as well as explaining the concepts of Mode, Median and Mean in a practical and easy to understand exercise to provide participants with a basis for further detailed modules.

### **Lean Fundamentals**

The Lean Fundamentals module provides a detailed understanding of the 5 Lean Principles and the concepts of Waste and Value-Added activity within a Lean context. It provides an overview of the key principles and objectives that underpin much of what is encompassed within Lean thinking and provides the participant with an insight into the significant differences between the traditional approach and that of Lean.

The module incorporates 2 elements:

- Formal classroom session to provide detailed grounding in the concepts
- Practical workshop which engages the participants in bringing the concepts to life in a simulated operational environment. This reinforces their understanding of the principles and concepts and how they interact while giving the participants their first experience of applying the knowledge acquired in an exercise utilising observation, team review and decision making. The simulation is also interspersed with other Lean Sigma modules relevant to the learning.

### **Value Stream Mapping**

This module provides an introduction to Value Stream Mapping, identifies and explains the advantages of VSM and outlines the reasons why it plays such an important role in the implementation of any Lean strategy.

It provides an overview and then takes the student through the various steps involved in performing VSM. It identifies and explains the necessary steps from initially identifying the product family through the process of constructing a Current State Map. It also gives consideration to the creation of Ideal State, and generation of a Future State Map.

### **5S & Visual Management**

This Module initially looks at 5S in the context of an overall Visual Management Framework and describes how it offers very real and measurable benefits to organisations which successfully implement it. It details how 5S contributes to improving workplace organisation and provides the first steps on the way to visual control, walking through the 5 “S”s and overviewing the steps required for implementation. Having overviewed 5S the module introduces the students to a variety of methods used for visual management in a lean environment. It covers the development and display of key indicators, use of visual standards and controls and includes a particular emphasis on Fail Safe or Poka Yoke as an approach to eliminating errors in the process.

## **Setup Reduction**

This module focuses on Set-up reduction as a crucial tool for organisations operating machine-based processes and trying to improve flow and produce parts to customer demand. It explains SMED as a methodology to enable dramatic and sustainable reductions in set-up times. It describes the conceptual stages of Set-up reduction and defines the techniques of the SMED system

Note: SMED is an acronym for Single-Minute Exchange of Dies

## **Takt Time**

This module introduces the concept of Takt time as a stepping stone to standardising operations. It initially deals with the concepts of Takt time and Cycle time and shows how to identify and calculate each. The unit then shows the student how to analyse the elements of work cycles using a Process Observation Form. It then explains the inter-relationship between Takt and Cycle time and shows the student how to balance work between operators using the Takt time / Cycle time Chart to achieve effective organisation and distribution of work within work teams.

## **Standard Work**

The Standard work module looks at the concept of Standardising operations. The three elements of Standard Work are then introduced, the benefits of Standard Work are identified, and the concept of Standard Work In Progress is explained.

The participant is then taken through the steps required to create Standard Work, and the necessary tools and techniques are explained.

## **Kanban**

This module takes the learner through an explanation of Kanban systems. It explains the difference between “Push” and “Pull” replenishment systems. It explains the functions and operation of Kanban systems and describes the six rules which underpin the effective deployment of Kanban systems. The module then explains the two main types of Kanbans and shows how to calculate the number of Kanbans required in a system to enable it to function correctly.

## **Kaizen**

The advantages of Kaizen over more traditional improvement methods are explored and many of the significant business benefits achievable from properly executed Kaizen events are discussed. Kaizen is a highly inclusive and empowering process and this module outlines some of the essential conditions which must be met in order to enable kaizen events to realise their full potential. The roles and responsibilities of key stakeholders will also be described as are the types of attitudes and behaviours required for participation.

## **Total Productive Maintenance (TPM) & Overall Equipment Effectiveness (OEE)**

This module provides a high level introduction to Total Productive Maintenance (TPM) and Overall Equipment Effectiveness (OEE). It describes the 8 Pillars of TPM and outlines its implementation and benefits to be achieved. In this context the module also demonstrates the power of OEE as a tool for evaluating the operation of key equipment. It discusses the breakdown of the OEE metric into its 3 separate but measurable categories of Availability, Performance and Quality and shows how each one contributes to overall OEE. OEE is often used as a key performance indicator as the results are stated in a generic form which allows comparison between different industries.

### **DMAIC: Define Phase**

This module guides participants through the initial phase of commencing a project and provides a structured approach to ensuring the project is set up for success. It initially looks at project selection and chartering with a perspective on alignment with the needs of the business, before focusing on the core of this phase i.e. effectively definition of scope of a project. It walks through process mapping in detail including the completion of an As-Is Process Map. It also looks at preliminary action planning and provides an overview of A3 methodology as a project statusing and communication tool.

### **DMAIC: Measure Phase**

This module focuses on the critical aspects of quantifying problems and projects with data, which is at the heart of Six Sigma methodologies. It addresses baselining of problems and project measures and introduces some of the more effective tools used. While it covers the central statistical themes of Variation, and Normal Distribution, it also takes the participants through non-statistical problem solving tools, and includes a review of metric tables, Histograms, Run charts and Pareto analysis.

### **DMAIC: Analyse Phase**

This module brings the participant through a structured process of “getting to root cause”. It explains the interaction of inputs and outputs with reference to a Process and leads into the use of tools such as Cause and Effect analysis and 5 Whys as approaches to identification of potential drivers of variation. It explains the concept of Process Capability and looks at how to analyse process maps to identify opportunities.

### **DMAIC: Improve Phase**

The focus of this module is on the development, agreement and prioritisation of countermeasure proposals to address root causes and deliver the required improvements. The module looks at approaches such as Benchmarking, Brainstorming and Force Field analysis, takes the participants through a method for selection of countermeasures by the team and also looks at FMEA as a tool for assessing and dealing with risk associated with improvement plans.

### **DMAIC: Control Phase**

The core of this module is centred on the concept of Statistical Process Control. It follows on from earlier learnings on 5S and Visual Control now focusing on measurable control of specific processes. It brings the participant to an understanding of the structure and application of SPC methods. It commences with a look at common cause and special cause variation before comparing SPC to Closed Loop Corrective action approaches. It then takes participants through SPC chart construction and finally looks at the interpretation of data captured