

Benchmark Six Sigma Black Belt

Lean Six Sigma Black Belt Training from MBB Experts. Absolutely best in class. Learn effortlessly and retain it for long.

This program is our highly recommended Program.

- *25 + Batches conducted.*
- *3000+ Professionals Trained*
- *40+ Industry Sectors covered.*
- *12+ Batches every year since 2001*

Benchmark Six Sigma provides training from Lean Six Sigma Green Belt up to MBB since 2007. We train 250 plus professionals every month

About Us



Who do we work with?

We work with clients in many Industry sectors. Some selected clients are shown here.

FMCG – P&G (US)

Pharma - Perrigo

Search – Google

Facility Management – JLL (US)

Liquor – Diageo (Italy)

E-commerce - Amazon

Aircrafts – Boeing

Maps – Here Maps

Footwear – Bata (multiple locations)

Electrical - Kirloskar

IT Products - Adobe

Telecom – France Telecom

Digital Marketing - Sapient

Credit Cards – American Express

Energy – Suzlon

Banking – JP Morgan Chase, Bank Dhofar (Muscat), Maubank (Mauritius)

Construction – William Hare (UK)

Elevators - Kone

Cargo - CMACGM

Agro Products – Syngenta, Indofoods (Indonesia)

Software – Siemens Infosoftware

Many more -

<http://www.benchmarksixsigma.com/content/our-clients>

Most of the global leaders that we worked with were the first client in the specific Industry Domain.

Few Basics about Lean Six Sigma

- Lean Six Sigma presents the world's best business problem solving methods in a single capsule. The goal of Lean Six Sigma Green Belt and Black Belt programs is not only to help participants build competence but also to gather practicable understanding so that they can apply the learning at their workplace.
- Lean Six Sigma delivers results through two methodologies DMAIC and DMADV
- The Lean Six Sigma DMAIC sequence (Define, Measure, Analyze, Improve, Control) is an improvement system for existing processes or products for enhanced performance.
- The Six Sigma DMADV process (Define, Measure, Analyze, Design, Verify) is an improvement system used to develop new processes or products at Six Sigma quality levels. It can also be employed if a current process requires breakthrough improvements

Lean Six Sigma Black Belt

Global Acceptance and
Body of Knowledge

- Benchmark Six Sigma are Globally Accepted and recognized by Exemplar Global since 2009.
- Benchmark Six Sigma programs have very high industry acceptance with Global Leaders like Google, Amazon, Boeing and P&G as client.
- Exemplar Global started in US and Australia in 1989. Its principal offices are located in Sydney, Australia, and Milwaukee, Wisconsin, in the United States. Additional offices in Brazil, Malaysia, Singapore, South Africa, Indonesia, Seoul, South Korea, China and Vietnam. Exemplar Global is part of ASQ family.
- Benchmark Six Sigma started Lean Six Sigma programs in 2001 while boards started offering accreditation much later in 2008 or 2009
- Next few slides show the Lean Six Sigma Black Belt Body of Knowledge used by Benchmark Six Sigma.

Competency 1

Lead DMAIC/DMADV
Projects – Apply Leadership

Performance Criteria	Learning Expected
1.1: Understand leadership responsibilities in the deployment of Six Sigma: <ul style="list-style-type: none"> • Providing resources • Managing change • Communicating ideas 	Describe the responsibilities of executive leaders and how they affect the deployment of Six Sigma in terms of providing resources, managing change, communicating ideas, etc.
	Describe and use various techniques for facilitating and managing organizational change.
1.2: Describe and identify organizational roadblocks: <ul style="list-style-type: none"> • Lack of resources • Management support • Recovery techniques • Change management techniques 	Describe the impact an organization's culture and inherent structure can have on the success of Six Sigma, and how deployment failure can result from the lack of resources, management support, etc.; identify and apply various techniques to overcome these barriers.
1.3: Use team formation theories: <ul style="list-style-type: none"> • Team types and constraints • Team roles • Team member selection • Launching teams 	Describe and apply techniques that motivate team members and support and sustain their participation and commitment.
	Facilitate the team through the classic stages of development: forming, storming, norming, performing and adjourning

Competency 2

Lead DMAIC/DMADV Projects – Manage Projects

Performance Criteria	Learning Expected
2.1: Define benchmarking, performance and financial measures: <ul style="list-style-type: none"> • Best practice • Competitive • Collaborative • Score cards • KPI's • COQ • ROI • NPV 	Define and distinguish between various types of benchmarking, including best practices, competitive, collaborative, etc. Business performance measures
	Define various business performance measures, including balanced scorecard, key performance indicators (KPIs), the financial impact of customer loyalty, etc.
	Define financial measures, such as: revenue growth, market share, margin, cost of quality (COQ), net present value (NPV), return on investment (ROI), cost-benefit analysis, etc.
2.2: Utilize time management for teams.	Employ various time management techniques including publishing agendas with time limits on each entry, adhering to the agenda, requiring pre-work by attendees, ensuring that the right people and resources are available, etc.
2.3: Understand management and planning tools	Define, select and apply tools such as: affinity diagrams, tree diagrams, process decision program charts (PDPC), matrix diagrams, interrelationship diagrams, prioritization matrices and activity network diagrams.
2.4: Collect customer data using various methods: <ul style="list-style-type: none"> • Surveys • Focus groups • Interviews observations 	Use various methods to collect customer feedback (e.g., surveys, focus groups, interviews, observation) and identify the key elements that make these tools effective.

Competency 3

Lead DMAIC/DMADV Projects – Coaching

Performance Criteria	Learning Expected
3.1: Outline process elements: <ul style="list-style-type: none"> • Components • Boundaries 	Define and describe process components and boundaries.
3.1: Understand team facilitation: <ul style="list-style-type: none"> • Team motivation • Team stages • Team communication • Team Dynamics 	Identify and use appropriate communication methods (both within the team and from the team to various stakeholders) to report progress, conduct milestone reviews and support the overall success of the project.
	Identify and use various techniques (e.g., coaching, mentoring, intervention, etc.) to overcome various group dynamic challenges, including overbearing/dominant or reluctant participants, feuding and other forms of unproductive disagreement, unquestioned acceptance of opinions as facts, groupthink, floundering, rushing to accomplish or finish, digressions, tangents, etc.
3.2: Define and use team performance evaluation and reward	Measure team progress in relation to goals, objectives and other metrics that support team success and reward and recognize the team for its accomplishments.
3.3: Analyze customer data using various methods: <ul style="list-style-type: none"> • Graphical • Statistical • Qualitative tools 	Use graphical, statistical, and qualitative tools to analyze customer feedback.
	Assist in translating customer feedback into project goals and objectives, including critical to quality (CTQ) attributes and requirements statements.

Competency 4

Lead DMAIC/DMADV
Projects – Facilitate Change

Performance Criteria	Learning Expected
4.1: Identify resistance to change.	Conduct an analysis to find restrainers and drivers to change.
4.2: Implement a plan to counter resistance to change	Outline steps taken that address issues identified at analysis, discussing: <ul style="list-style-type: none">• Stakeholder management• Communications plans• Organizational readiness for change
4.3: Identify customers: <ul style="list-style-type: none">• Identify customers• Classify customers	Identify and classify internal and external customers as applicable to a particular project, and show how projects impact customers.

Competency 5 - a

Lead DMAIC/DMADV Projects – Define

Performance Criteria	Learning Expected
5.1: Outline process elements: <ul style="list-style-type: none">• Components• Boundaries	Define and describe process components and boundaries. Recognize how processes cross various functional areas and the challenges that result for process improvement efforts.
5.2: Identify owners and stakeholders: <ul style="list-style-type: none">• Process owners• Suppliers• Internal customers• External customers	Identify process owners, internal and external customers, and other stakeholders in a project.
5.3: Analyze customer data using various methods: <ul style="list-style-type: none">• Graphical• Statistical• Qualitative tools	Use voice of the customer analysis tools such as quality function deployment (QFD) to translate customer requirements into performance measures.
5.4: Outline the project charter and project statement: <ul style="list-style-type: none">• Project elements• Problem statement	Define and describe elements of a project charter and develop a problem statement, including baseline and improvement goals.
5.5: Develop the project scope using: <ul style="list-style-type: none">• Definitions• Pareto charts• Process maps	Undertake the development of project definition/scope using Pareto charts, and process maps.

Competency 5 - b

Lead DMAIC/DMADV Projects – Define

<i>Performance Criteria</i>	<i>Learning Expected</i>
5.6: Develop the project metrics using: <ul style="list-style-type: none"> • Primary metrics • Consequential metrics • Key project metrics 	Undertake the development of primary and consequential metrics (e.g., quality, cycle time and cost) and establish key project metrics that relate to the voice of the customer.
5.7: Apply project planning tools: <ul style="list-style-type: none"> • Gantt charts • CPM • Pert 	Use project tools such as Gantt charts, critical path method (CPM), and program evaluation and review technique (PERT) charts, and activity network diagrams.
5.8: Record project documentation: <ul style="list-style-type: none"> • Spreadsheets • Story boards 	Provide input and select the proper vehicle for presenting project documentation (e.g., spreadsheet output, storyboards, etc.) at phase reviews, management reviews and other presentations.
5.9: Define and utilize project risk analysis: <ul style="list-style-type: none"> • Purpose • Benefits • Impacts 	Describe the purpose and benefit of project risk analysis, including resources, financials, impact on customers and other stakeholders.
5.10: Project milestones: <ul style="list-style-type: none"> • Objectives vs outcomes • Lessons learned • Opportunities 	Describe the objectives achieved and apply the lessons learned to identify additional opportunities. Present findings in a clear, concise manner.
5.11: Define, select and use management planning tools.	Define, select, and use affinity diagrams, interrelationship digraphs, tree diagrams, prioritization matrices, matrix diagrams, process decision program (PDPC) charts, and activity network diagrams.
5.12: Calculate process performance	Calculate process performance metrics such as defects per unit (DPU), rolled throughput yield (RTY), cost of poor quality (COPQ), defects per million opportunities (DPMO) sigma levels and process capability indices.

Competency 6.

Lead DMAIC/DMADV Projects – Measure

<i>Performance Criteria</i>	<i>Learning Expected</i>
6.1 Define and describe measurement and metrology: <ul style="list-style-type: none"> • Continuous data • Discrete data • Elements of metrology • Calibration • Traceability to reference standards • Standards and measurement devices 	Define and describe measurement methods for both continuous and discrete data.
	Define and describe elements of metrology, including calibration systems, traceability to reference standards, the control and integrity of standards and measurement devices, etc.
6.2 Identify use of measurement systems in enterprise.	Identify how measurement systems can be applied in marketing, sales, engineering, research and development (R&D), supply chain management, customer satisfaction and other functional areas.
6.3: Describe and apply basic probability concepts: <ul style="list-style-type: none"> • Independence • Mutually exclusive • Multiplication rules 	Describe and apply concepts such as independence, mutually exclusive, multiplication rules, etc.
6.4: Implement a measurement systems analysis tool.	Calculate, analyze, and interpret measurement system capability using repeatability and reproducibility (GR&R), measurement correlation, bias, linearity, percent agreement, and precision/tolerance (P/T).
6.5: Use appropriate software for analysis and project completion	Understand advanced techniques for analysis using statistical and other data analysis software.
6.6: Measure Tollgate review	Present findings of the measure stages in a concise manner.

Competency 7

Lead DMAIC/DMADV Projects – Analyze

<i>Performance Criteria</i>	<i>Learning Expected</i>
7.1: Undertake hypothesis testing: <ul style="list-style-type: none"> • Basics • Tests for means, variances, and proportions • Paired-comparison tests • Single-factor analysis of variance (ANOVA) • Chi square 	Define and distinguish between statistical and practical significance and apply tests for significance level, power, type I and type II errors. Determine appropriate sample size for various test.
	Define and describe paired-comparison parametric hypothesis tests.
	Define terms related to one-way ANOVAs and interpret their results and data plots
	Define and interpret chi square and use it to determine statistical significance.
7.2: Select and use contingency tables.	Select, develop and use contingency tables to determine statistical significance.
7.3: Ability to handle non-normal data.	Recognition of non-normal data.
	Select, develop and use various non-parametric tests, including Mood's Median, Levene's test, Kruskal-Wallis, Mann-Whitney, etc.
7.4: Use various tools and techniques to analyse data: <ul style="list-style-type: none"> • Gap analysis • Root cause analysis • Waste analysis 	Use various tools and techniques (gap analysis, scenario planning, etc.) to compare the current and future state in terms of pre-defined metrics.
	Define and describe the purpose of root cause analysis, recognize the issues involved in identifying a root cause, and use various tools (e.g., the 5 whys, Pareto charts, fault tree analysis, cause and effect diagrams, etc.) for resolving chronic problems.
	Identify the 7 classic wastes (overproduction, inventory, defects, over-processing, waiting, motion and transportation) and other forms of waste such as resource under-utilization, etc.
7.5: Analyze Tollgate review	Present findings of the analyze stages in a concise manner.

Competency 8

Lead DMAIC/DMADV Projects – Improve/ Design

<i>Performance Criteria</i>	<i>Learning Expected</i>
8.1: Define and Describe Design of Experiments (DOE): <ul style="list-style-type: none"> • Basic terms • Main effects • Design principles • Planning experiments • One-factor experiments • Two-level fractional factorial experiments • Full factorial experiments 	Define and describe basic DOE terms such as independent and dependent variables, factors and levels, response, treatment, error, repetition, and replication.
	Interpret main effects and interaction plots.
	Apply to design the DOE principles, including power and sample size, balance, repetition, replication, order, efficiency, randomization, blocking, interaction, confounding, resolution, etc.
	Plan, organize and evaluate experiments by determining the objective, selecting factors, responses and measurement methods, choosing the appropriate design, etc.
	Design and conduct completely randomized, randomized block and Latin square designs and evaluate their results.
	Design, analyze and interpret these types of experiments and describe how confounding affects their use.
	Design, conduct and analyze full factorial experiments.
8.2: Select and apply various reduction, elimination and mitigation tools: <ul style="list-style-type: none"> • Waste elimination • Cycle-time reduction • Kaizen and kaizen blitz • Risk analysis 	Select and apply tools and techniques for eliminating or preventing waste, including pull systems, kanban, 5S, standard work, poka-yoke, etc
	Use various tools and techniques for reducing cycle time, including continuous flow, single-minute exchange of die (SMED), etc.
	Define and distinguish between these two methods and apply them in various situations.
	Use tools such as feasibility studies, SWOT analysis (strengths, weaknesses, opportunities and threats), PEST analysis (political, environmental, social and technological) and consequential metrics to analyze and mitigate risk.
8.3: Develop plans for implementing improved process.	Develop plans for implementing the improved process (i.e., conduct pilot tests, simulations, etc.), and evaluate results to select the optimum solution.

Competency 9

Lead DMAIC/DMADV
Projects – Control/Validate

<i>Performance Criteria</i>	<i>Learning Expected</i>
9.1: Using other tools for control and maintenance: <ul style="list-style-type: none"> • TPM • Visual factory • Measurement system reanalysis • Control plan 	Define the elements of TPM and describe how it can be used to control the improved process.
	Define the elements of a visual factory and describe how they can help control the improved process.
	Review and evaluate measurement system capability as process capability improves, and ensure that measurement capability is sufficient for its intended use.
9.2: Understanding how to sustain improvements: <ul style="list-style-type: none"> • Lessons learned • Training plan deployment • Documentation • Ongoing evaluation 	Develop a control plan for ensuring the ongoing success of the improved process including the transfer of responsibility from the project team to the process owner.
	Document the lessons learned from all phases of a project and identify how improvements can be replicated and applied to other processes in the organization
	Develop and implement training plans to ensure continued support of the improved process.
	Develop or modify documents including standard operating procedures (SOPs), work instructions, etc., to ensure that the improvements are sustained over time.
9.3: Financial Review/Validation	Describe methods of Savings/Improvement validation by an independent entity (Financial Analyst)

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