

LEAN SIX SIGMA INTRODUCTION



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OVERVIEW OF LEAN

- What is Lean?
 - Started in mid 70's as TQM, Total Quality Management.
 - Standardized process for the Toyota Production System
 - Designed for production plants to improve flow, increase speed, and reduce cycle time.
 - Over time Lean Manufacturing became Lean Thinking for non-manufacturing industries.
- Key Concepts of Lean
 - 5S – Sort, Set, Shine, Standardize, Sustain
 - JIT – Just-In-Time, schedule resources to arrive when production begins & just before customer delivery required
 - Visual Controls – Display operations status in easy to view format so corrective action can be taken immediately.
 - Design for Production – Performance is a function of design variables allowing design tweaks to increase performance.

LEAN THINKING

- Gain value with less work.
- Eliminate Waste
- Processes which fail to create value are deemed waste.
- Optimize processes
- Processes which are redundant or time consuming should take priority.
- Processes overly complex or confusing should be broken down into multiple simpler processes.
 - A sign of overly complex processes are those which require involvement from many different departments and/or has varying quality of its output.



7 wastes – Think about how you deal with information

Transport (Transaction Costs)

Inventory (Excess Work In Progress)

Motion (Wasted Effort)

Delays

Overproduction

Over-processing

Defects (Rework)

LEAN THINKING – REDUCING WASTE

- Making only what customer wants when they want it eliminates Overproduction:
 - Overproduction of features occurs often in traditional IT because stakeholders are only given one opportunity to present their system needs every 5 to 10 years. Recognizing that this is their only chance, stakeholders specify everything they've ever dreamed of with the hope that it will deliver value.
 - **Reorganize your work to deliver small batches of features frequently.**
 - **Use cross-functional teams with short cycle times.**
 - **Incorporate a customer feedback loop to insure users really want features.**
- The main cause of excess Inventory is overproduction:
 - Overproduction is made worse by doing the work in specialist teams that throw it over the fence to the next team at the end of a phase. When work enters a team in a big batch it blocks other work and takes a long time to process. When the team is slow, under-resourced or has a long lead time then work sits in a queue for a long time.
 - **Set up cross functional teams to do the work for each requirement Just in Time to meet customer demand.**
 - **Set up a Kanban board for each team with columns for request, analyze, design, build, test and deploy. You can clearly see where work piles up.**

OVERVIEW OF SIX SIGMA

- What is a sigma?
 - The Greek letter Sigma, σ , is a statistical term used to represent the standard deviation. It is a measure of variation.
- What is a Sigma Level?
 - Defect Rate or Confidence Rate – Most processes perform at 3-4 Sigma Level, Or 99% Confidence, 1% Defective.
- What is 6σ ?
 - Goal is to eliminate defects & reduce variation.
 - 6σ performs at 99.999999% Confidence, Improves products 100 times more than 4σ .
 - When your product is 6σ it tells your customers that the quality level is excellent.
- Key Concepts of Six Sigma
 - Limit defects & variability in business processes.
 - Provide a means to measure quality, defects, and success.
 - Provide a framework for businesses to shape strategy, align with customer needs, & improve the effectiveness of processes.

DIFFERENCES & SIMILARITIES

- Differences between Lean & Six Sigma
 - Ownership
 - **Lean aims to continually improve across all operations, requires culture change.**
 - **Six Sigma aims to reduce variation in specific areas of operation.**
 - Procedure
 - **Lean is all about transferring knowledge to implement culture change.**
 - **Six Sigma is structured to root cause, test hypothesis, validate, then implement solution.**
- Similarities between Lean & Six Sigma
 - Goals are to reduce cost/waste, add value to bottom line, satisfy your customers, & reduce defects.
 - Both involve commitments from Management to support efforts.
 - Technical expertise is required from Engineering, Operations, Sales & Management.
 - Team-based methodologies used to:
 - **Set Baseline - Map & evaluate current processes.**
 - **Benchmark – Consider alternatives & develop viable alternatives.**
 - **Implement Improvement & Evaluate the effects.**
 - **Review changes in performance & improve Quality.**

OVERVIEW OF LEAN SIX SIGMA

- It is a management approach as well as a set of tools and techniques.
- Customer / Market / Profit / Shareholder focused for clear Project Definition.
- Can yield significant financial benefits in any industry.
- Focused on results: Customer Satisfaction, Improved Quality, Reduced Costs, Increased Revenue.
- Requires Solid Baseline to track improvement metrics.
- Tracks progress & evaluates it's value based on savings.
- Requires training at all levels to sets clear goals & expectations.

WHAT ARE BLACK BELTS?

- Certified through Accredited Providers
 - ASQ - American Society for Quality
 - Professional Association for Black Belt holders
 - Recognized as authority in Six Sigma Certification
 - IASSC – International Association for Six Sigma Certification
 - Provides Professional Association & accreditation for Trainers
 - Recognized as authority in Lean Six Sigma Certification
 - SSC – The Council for Six Sigma Certification
 - Recognized as Industry Standard for both SS & LSS by US Gov't
 - Also provides accreditation for trainers, but requires Body of Knowledge
 - No Professional Association
- Trained to implement standardized methodologies
 - Lean Six Sigma borrows techniques from multiple methodologies.
 - Six Sigma is strict in following only Six Sigma approved techniques.
- Manages Black Belt Projects
 - Follows a slightly different flow than PMI PMP.

TECHNIQUES & TOOLS USED

- DMAIC Methodology
 - Define, Measure, Analyze, Improve, Control
- Quality Function Definition
- Process Mapping
 - Gather information, highlight handoffs, inputs vs outputs,
 - Build draft review with team, update map.
- Value Stream Map
 - Analyzes process map to reduce steps and/or increase quality by 10%!
- Pareto Analysis
 - 80/20 Rule – Doing 20% of the effort can result in 80% of the benefit.
 - Reviews all possible courses of action, zeros in on most effective.
- Design of Experiments (DOE)
 - Pilot program to test theories may be necessary.
- Minitab
 - Statistical Analysis Software for Black Belts
 - Templates available for project management.

DMAIC METHODOLOGY EXAMPLE

Lean Six Sigma Methodology and Roadmap for Common Tool Usage

Define	Measure	Analyze	Improve	Control
Project Charter				
Process Map				
Rolled Throughput Yield				
Quality Function Deployment				
	Value Stream Map			
	Cause & Effect Matrix			
	Potential Failure Mode and Effect Analysis			
	Data Collection & Sampling			
	Measurement System Analysis			
	Pareto Analysis			
	Capability Study			
		Components of Variation		
		Hypothesis Testing/Confidence Intervals		
		Design of Experiments		
		Control Plan		
			Celebrate	

QUESTIONS?

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