

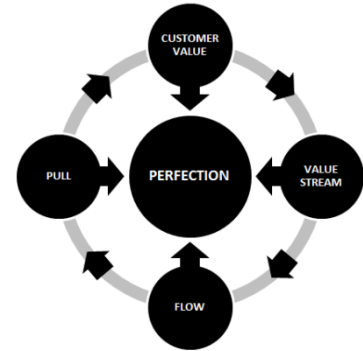
LEAN SIX SIGMA 101

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We've all heard terms like "Lean" and "Six Sigma" (and even "Lean Six Sigma") thrown around in weekly meetings, seen them in corporate memos, and read them on professional networking and other websites. What do they mean? Are they all the same? Are they competing concepts? Here are the answers you need:

Yes, both methods were initially developed in the manufacturing environment. However, Lean and Six Sigma rapidly migrated into and provided significant revenue growth and cost savings in practically every industry across the Commercial, Government, and Non-Profit sectors.

LEAN (Manufacturing) also known as Toyota Production System (TPS): This methodology is focused on **the reduction and elimination of waste** in systems and processes in order to **reduce lead time and increase velocity**. Specific classifications of waste include: **D**efects, **O**verproduction, **O**ver-processing, **M**otion, **E**xcess inventory, **D**elay, **P**oor communication, **I**njury, and **T**ransportation. These represent the **DOOMED PIT™** into which you are dumping your potential profit. Lean projects (the most popular of which are known as *Kaizen* events) follow four basic principles in the pursuit of the ultimate goal, Perfection. These principles include: Customer Value, Value Stream, Flow, and Pull.

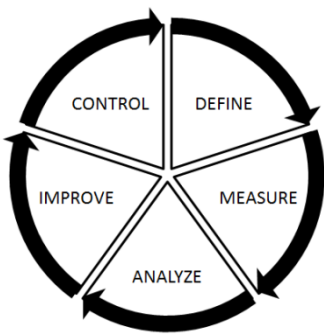


Imagine: You make coffee every morning at the office, but it takes too long and your co-workers are mad because they have to wait for their caffeine injection. The coffee machine is located on the east wall of the cafeteria, but the coffee grounds are located on the west side. The filters are located in the cupboards along the north wall, and the sink is sitting on the south end counter. The **T**ransportation required to complete this process is a form of *waste* that is negatively impacting the supplier (you) and the customers (your coworkers) because it takes too long. Consolidating the resources (moving the coffee machine, grounds, and filters to the sink area) will eliminate **T**ransportation, reduce your lead time, and improve customer (and supplier) satisfaction.

Tools include: Value Stream Maps, Process Maps, Spaghetti Maps, and Line Balance Charts.

Measures include: Process Lead Time, Cycle Time, Flow Time, Takt Time, Work-in-Progress (WIP), Time Value of Inventory, and Throughput Rate.

SIX SIGMA (6σ): This methodology is focused on the **reduction of variation** in systems and processes in order to **improve product and service quality**. Specific classifications of variation include Common Cause (expected, natural variation within a process) and Special Cause (unexpected, unnatural variation with an assignable, typically external source). Six Sigma projects follow the Define, Measure, Analyze, Improve, and Control or "DMAIC" (pronounced *duh-may-ick*) framework and focus on achieving the quality goal of 3.4 (or less) defects per every million opportunities (99.99966% defect-free).



Imagine: You are shooting arrows at a target. Your heartbeat and breathing cause your arms to move slightly as you aim at the target and release the bow string. That's *Common Cause* variation. If someone bumps your elbow as you shoot, that would be *Special Cause* variation. Preventing the Special Cause variation (cordoning the area) and reducing the Common Cause variation (breath control, etc.) will improve your performance (*accuracy* and *precision*).

Tools include: Process Behavior Charts, Histograms, Box-and-Whisker Plots, Regression Analysis, Cause-and-Effect Matrices, and Control Plans.

Measures include: Mean, Standard Deviation, Yield, Defects per Million Opportunities (DPMO), Capability Indices, Performance Indices, and Sigma Level.

LEAN SIX SIGMA: In today's global marketplace, Speed and Quality cannot be mutually exclusive goals. This approach combines the Lean and Six Sigma methodologies (along with Theory of Constraints and Business Process Reengineering) within the DMAIC framework to **increase speed** and **improve quality, positively affecting customer satisfaction** while **reducing costs** and **growing revenue** – thus **boosting overall profitability** by progressively attacking the top AND bottom lines.