

## Six Sigma vs. Lean

By Dan Sommers  
NEO Manufacturing Expert

Both Six Sigma and Lean are continual improvement methodologies used to create value for the customer and improve process efficiencies. While the ultimate goals of both methodologies are similar, the approaches to achieve these goals are different.

**Six Sigma is breakthrough change, radical change, & transformational change.**

Quantitatively, this is reducing the cost of poor quality and reducing defects by orders of magnitude. Stated another way, this is reducing the cost of poor quality and reducing defects by 10X, 100X, or 1000X.

**Lean is incremental change.**

A 10% cost reduction, or a 20% defect reduction. In the book, *Leading Change*, John Kotter states, "The single biggest argument offered against the need for transformational change is that organizations can succeed with incremental change." In the short term, in certain industries, this can be true. But in the long term, transformational change is required to succeed.

**Six Sigma provides a structured approach to problem solving:**

Define, Measure, Analyze, Improve, Control (DMAIC). At each phase, tools are specified to achieve the results.

**Lean provides tools, but no structured process for implementation of the tools.**

It is left to the experience & intuition of the practitioner to sequence the tools to achieve results.

**Six Sigma attacks variation.**

W. Edwards Deming says, “The essence of management is prediction.” It is variation that makes prediction difficult. By using the Six Sigma structured approach to continually reduce variation, processes become predictable, which enables proper decisions and actions.

**Lean attacks waste.**

Waste is a result of variation, an inability to predict accurately. Excess people, excess time, excess transportation, excess inventory, excess motion, excess waiting, excess production, excess processing, and excess defects are the result of an inability to predict accurately.

**Six Sigma defines a non-value-added activity as anything that is done because the process is not perfect.**

Stated another way, what activities will be eliminated when the process is perfect? This is the gold standard to evaluating processes. By comparing all activities to perfection and continually moving toward perfection, organizations remain world class.

**Lean defines a value-added activity as something the customer will pay for.**

However, when a competitor designs a process without extraneous activities, customers are not willing to pay for the previous process. Using the definition of a value-added activity can leave an organization in a noncompetitive position.

**Six Sigma uses the experience and intuition of the people in the process and uses data and science to reduce variation and improve processes.**

Ellis Ott says, “Processes speak a language – a language of data. Plot the data – make the process talk.” How can a process be improved properly if it is not listened to? Once the process is measured and the data analyzed, fundamental principles of science are applied to radically improve the process. In manufacturing, where raw materials are transformed into finished goods, breakthrough improvement requires understanding the fundamentals of physical science (physics, chemistry, material science, and others).

**Lean uses the experience and intuition of the people in the process.**

This generates incremental improvement.

**Six Sigma leverages Black Belts who are typically external to the process under study.**

The combination of the external perspective of the subject matter experts, along with the internal perspective of the operators generates breakthrough improvement.

**Lean relies on the people that are internal to the process.**

While this approach generates acceptance and buy-in of the changes, it generates incremental improvement.

**Six Sigma measures results.**

The two primary metrics are reduction of the cost of poor quality and reduction of defects. These primary metrics are defined, measured, reported, tracked, and expected at each phase of DMAIC.

**Lean expects results.**

However, metrics typically are not stressed – it is common sense.



## In Summary

### **Six Sigma**

- Breakthrough change.
- Provides a structured approach to problem solving (DMAIC).
- Attacks variation.
- Defines non-valued-added activities.
- Uses experience, intuition, data, and science to solve problems.
- Problem solvers (Black Belts) are external to the process.
- Results (savings and defects) are defined, measured, reported, and expected.

### **Lean**

- Incremental change.
- No structured approach to problem solving.
- Attacks waste.
- Defines value-added activities.
- Uses experience and intuition to solve problems.
- Problem solvers (operators) are internal to the process.
- Results are expected, but typically not defined or measured.

### **Need help?**

---

Contact Tim Angbrandt with NEO Manufacturing Experts for your Free Consultation.

440-567-7148

[tim@neo-mfgexperts.com](mailto:tim@neo-mfgexperts.com)

---