

5. *System Management.* Successful organizations understand that their many individual processes are interrelated and that, in addition to being managed individually, they must be managed within an overall system.
6. *Continual Improvement.* Continual improvement is the key to long-term success and high performance. Successful managers recognize that processes must be reviewed and improved continuously to ensure that the organization stays competitive.
7. *Fact-Based Decisions.* Organizations that base their decisions on factual data are more likely to make the correct decision than those that do not.
8. *Close Supplier Relationships.* Organizations that partner and work closely with suppliers ensure that both the organization and the suppliers are better able to achieve success.

MORE:

- Overview on the ASQ website: <http://asq.org/learn-about-quality/iso-9000/overview/overview.html>
- Arter, Dennis R., and J.P. Russell. *ISO Lesson Guide 2008: Pocket Guide to ISO 9001-2008, Third Edition* (Milwaukee: ASQ Quality Press, 2009).
- ASQ. *ANSI/ISO/ASQ Q9000-2005 Quality management systems—fundamentals and vocabulary* (Milwaukee, WI: ASQ, 2005).
- ASQ. *ANSI/ISO/ASQ Q9001-2008 Quality management systems—requirements* (Milwaukee, WI: ASQ, 2008).

- Webcast – “ISO 9001:2008 for Small and Medium-Sized Businesses” by Denise Robitaille: <http://asq.org/2010/10/iso-9000/iso-9001-2008-for-small-and-medium-sized-businesses.html>

PDCA

Dr. W. Edwards Deming was a strong proponent of the plan-do-check-act (PDCA) cycle. The PDCA improvement model is a detailed sequence of steps more associated with the standards or requirements approach seen in the ISO 9000 family of tools. Specific occurrences are identified and detailed targets are set for improvement tasks. Dr. Deming gives credit to his mentor, Walter Shewhart, for the development of the PDCA cycle. PDCA is a four-step model for carrying out change (see Figure 2). Just as a circle has no end, the PDCA cycle (also known as the plan-do-study-act cycle) should be repeated again and again for continuous improvement.

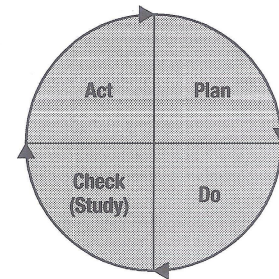


Figure 2 Plan–Do–Check/Study–Act cycle.

PDCA involves the following:

PLAN

- Select project
- Define problem and aim
- Clarify/understand
- Set targets/schedules
- Inform and register the project
- Come up with most suitable recommendation

DO

- Record/observe/collect data
- Examine/prioritize/analyze
- Justify/evaluate cost
- Investigate/determine most likely solutions
- Test and verify/determine cost and benefits
- Test most likely causes

CHECK (STUDY)

- Observe the effects of the change or test
- Consolidate ideas
- Select next project
- Seek approval from management

ACT

- Plan installation/implementation plan
- Install/implement approved project/training
- Maintain/standardize

MORE:

- Webcast – “An Introduction to the PDCA Cycle, Part 1” by Jack ReVelle: <http://asq.org/2011/07/continuous-improvement/intro-to-pdca-1.html>

Six Sigma

Originally developed by Bill Smith at Motorola in 1986, Six Sigma became well known after Jack Welch made it a central focus of his business strategy at General Electric starting in 1995. Basically, Six Sigma is about collecting data on a process and using that data to analyze and interpret what is happening in that process so that the process can be improved to satisfy the customer.

Sigma is a statistical term that refers to the standard deviation of a process about its mean. In layman's terms, that means how close something comes to being exactly how it was intended to be, whether it's a product or service. Six Sigma means that there will be only 3.4 errors or defects per million opportunities. For example, out of 1 million widgets manufactured, on average only 3.4 will be so far from what they're supposed to be that they are unusable. In a service environment, it could be an average of only 3.4 orders incorrectly inputted or fulfilled for every 1 million received. It

should be obvious that this is an extremely low incidence of error in any situation.

Six Sigma is implemented through the Define–Measure–Analyze–Improve–Control (DMAIC) methodology. DMAIC takes a problem that has been identified by the organization and utilizes a set of tools and techniques in a logical fashion to arrive at a sustainable solution. The resultant solution(s) will minimize or eliminate the problem, placing the organization in a more competitive position with its product or service.

MORE:

- Overview on the ASQ website: <http://asq.org/learn-about-quality/six-sigma/overview/overview.html>
- Mukherjee, Shirshendu. “A Dose of DMAIC” from *Quality Progress* magazine, August 2008.
- Shankar, Rama. *Process Improvement Using Six Sigma: A DMAIC Guide* (Milwaukee: ASQ Quality Press, 2009).
- Webcast – “A Webcast Overview of the Seven Lean Six Sigma Tools” by Jack ReVelle: <http://asq.org/2010/08/six-sigma/overview-seven-LSS-tools.html>
- Webcast – “The Seven Lean Six Sigma Tools Webcast Series: Value Stream Mapping” by Jack ReVelle: <http://asq.org/2010/08/quality-tools/value-stream-mapping.html>
- Webcast – “Seven Lean Six Sigma Tools Webcast Series: 5S” by Jack ReVelle: <http://asq.org/2010/08/six-sigma/LSS-tools-5s.html>

- Webcast – “The Seven Lean Six Sigma Tools Webcast Series: Kaizen” by Jack ReVelle: <http://asq.org/2010/08/quality-tools/LSS-tools-kaizen.html>

Lean

Lean is a practice that considers wasteful the expenditure of resources for any goal other than the creation of value for the end customer. If you drive improvements by always keeping in mind the end value to the customer, lean proponents say it will improve your products and services as well as your organization as a whole. And these proponents have good reason to say this: lean is derived primarily from the Toyota Production System (TPS), which took Toyota from a small company to the world’s largest automaker.

Lean typically divides waste into seven types:

- Overproduction
- Waiting: time in queue
- Transportation
- Non-value-adding processes
- Inventory
- Motion
- Costs of quality: scrap, rework, and inspection

Most recently, many organizations have used Six Sigma and lean at the same time and called it Lean-Six Sigma (LSS) or Lean Sigma. Michael George, in *Lean Six Sigma for Service*,² identifies the major areas of emphasis common to the