

The Simple Leader: Plan, Do, Study, Adjust

Even Deming preferred PDSA to PDCA

“Excellent firms don’t believe in excellence—only in constant improvement and constant change.”
—Tom Peters

The plan-do-study-act (PDSA) cycle is the core component of continuous improvement programs. You may have heard it called the plan-do-check-act (PDCA) cycle—and they are very similar—but I have come to prefer PDSA, with the A standing for “adjust,” for reasons I’ll explain shortly. Understanding the cycle and its application to continuous improvement is critical for leadership. But first, a history lesson.

In November 2010, Ronald Moen and Clifford Norman wrote a well-researched article, “Circling Back” in *Quality Progress* (November, 2010) that detailed the history behind PDCA and PDSA. The cycles have their origins in 1939, when Walter Shewhart created the specification-production-inspection (SPI) cycle. The SPI cycle was geared toward mass production operations, but Shewhart soon realized the potential application of the scientific method to problem solving, writing that “it may be helpful to think of the three steps in the mass production process as steps in the scientific method. In this sense, specification, production, and inspection correspond respectively to hypothesizing, carrying out an experiment, and testing the hypothesis. The three steps constitute a dynamic scientific process of acquiring knowledge.”

At the time, W. Edwards Deming was working with Shewhart to edit a series of Shewhart’s lectures into what would become Shewhart’s *Statistical Method from the Viewpoint of Quality Control*, published in 1939. Deming eventually modified the cycle and presented his design-production-sales-research cycle in 1950, which is now referred to as the Deming cycle or Deming wheel. According to Masaaki Imai, Toyota then modified the Deming wheel into the PDCA cycle and began applying it to problem solving.

In 1986, Deming again revised the Shewhart cycle, with another modification added in 1993 to make it the PDSA cycle, or what Deming called the Shewhart cycle for learning and improvement. (Deming never did like the PDCA cycle. In 1990, he wrote Ronald Moen, saying: “Be sure to call it PDSA, not the corruption PDCA.” A year later he wrote: “I don’t know the source of the cycle that you propose. How the PDCA ever came into existence I know not.”)

The PDCA cycle has not really evolved in the past 40 years and is still used today at Toyota. The PDSA cycle continues to evolve, primarily in the questions asked at each stage. Although both embody the scientific method, I personally prefer the PDSA cycle, because “study” is more intuitive than “check.” Deming himself had a problem with the term “check,” as he believed it could be misconstrued as “hold back.” I also prefer “adjust” to “act,” as it conveys a better sense of ongoing, incremental improvement. Just be aware that some very knowledgeable and experienced people prefer the pure PDCA.

Let’s take a look at each component of PDSA:

Plan: Ask objective questions about the process and create a plan to carry out the experiment: who, what, when, where, and a prediction.

Do: Execute the plan, make observations, and document problems and unexpected issues.

Study: Analyze the data, compare it to expectations, and summarize what was learned.

Adjust: Adopt and standardize the new method if successful; otherwise, identify changes to be made in preparation for starting the whole cycle over again.

It’s important to realize that the PDSA cycle is valuable at both process and organizational levels. For example, you start the plan stage of the PDSA cycle while evaluating your current state and creating a *hoshin* plan. As you execute the annual and breakthrough objectives of the *hoshin* plan, you move into the “do” quadrant. On a regular basis, you evaluate the *hoshin* plan and the results of the goals (study), then modify it as necessary for the next revision of the *hoshin* plan.

This article is an excerpt from [The Simple Leader: Personal and Professional Leadership at the Nexus of Lean and Zen](#) (Gemba Academy LLC, 2016).

Kevin Meyer has more than 25 years of executive leadership experience, primarily in the medical device industry, and has been active in lean manufacturing for more than 20 years serving as director and manager in operations and advanced engineering, and as CEO of a medical device manufacturing company. He consults and speaks at lean events; operates the online knowledgebase, [Lean CEO](#), and the lean training portal, [Lean Presentations](#); and is a partner in [GembaAcademy.com](#), which provides lean training to more than 5,000 companies. Meyer is co-author of [Evolving Excellence—Thoughts on Lean Enterprise Leadership](#) (iUniverse Inc., 2007) and writes weekly on a blog of the same name.