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How To Roll the Deming Wheel

By Hank Marquis
Hank is EVP of Knowledge Management at Universal Solutions Group, and Founder and Director of NABSM.ORG. Contact Hank by email at hank.marquis@usgct.com. View Hank's blog at www.hankmarquis.info.

The IT Infrastructure Library® (ITIL®) indicates that systematic process improvement requires a Quality Management System (QMS). As usual, the ITIL is sketchy about the QMS, but does devote a fair amount of ink to one in particular -- the Plan-Do-Check-Act (PDCA) of the Deming cycle.

The power of PDCA lies in its simplicity. While easy to understand, it is often difficult to accomplish on an on-going basis due to complacency, distractions, loss of focus, lack of commitment, re-assigned priorities, lack of resources, etc.

PDCA is a cyclic improvement/problem resolution tool. Each cycle moves closer to the objective. This approach builds on the fact that knowledge and skills are always limited, but can improve as we go.

While most executives and managers claim full knowledge and on-going application of the PDCA cycle, few have in-depth understanding, and even fewer practice PDCA on a consistent basis.

Following I explain PDCA and how to use it.

The Power Behind the Wheel

PDCA can deliver "quick fixes" typical to western management approaches, but it also works well for incremental/continuous process improvements typical to eastern management approaches. Regardless of management style, PDCA helps ensure improvement.

Bell Laboratories scientist Walter Shewhart, the statistician who also developed statistical process control, developed the "Shewhart Cycle" Plan-Do-Check-Act (PDCA) concept in the 1930's.

In the 1950's Dr. W. Edwards Deming, friend and student of Shewhart popularized PDCA. PDCA became associated with him and became known as the "Deming Wheel" even though he always referred it as the "Shewhart Cycle." Later in Deming's career, he modified PDCA to Plan-Do-Study-Act (PDSA) to describe more precisely his recommendations. Six Sigma programs refer to this cycle as Define-Measure-Analyze-Improve-Control (DMAIC).

Cycles of Improvement

Many times an immediate and dramatic improvement is not possible. There truly is no "quick fix" for many problems. Sometimes, it is not even possible to completely define the problem, much less the fix. PDCA provides a method for improving any process systematically. Used consistently, PDCA delivers improvements.

Practitioners use PDCA as a guide to analyze processes. The goal is to identify errors or omissions that cause the output of the process to fall short of expectations. PDCA is useful anywhere the object is improved performance:

- As a model for continuous improvement
- When starting a new improvement project
- When developing a new or improved design of a process, product or service
- When defining a repetitive work process
- When planning data collection and analysis in order to verify and prioritize problems or root causes
- When implementing any change

Of course, adopting ITIL spans all the above areas, so it makes sense to use PDCA for ITIL adoption as well.

4 Steps to Improvement

PDCA is a four-step model for carrying out change. Just as a circle has no end, the PDCA cycle repeatedly executes in pursuit of continuous improvement.

Using the PDCA concept is straightforward. It is a very simple yet powerful concept to coordinate your continuous improvement efforts. It emphasizes and demonstrates that improvement programs must start with careful planning, must result in effective action, and must move on again to careful planning in a continuous cycle.

Use PDCA in team meetings to take stock of what stage improvement initiatives are at, and to choose the appropriate tools to see each stage through to successful completion.

The four steps of PDCA are:

1. **Plan.** Recognize an opportunity and plan a change. Establish the objectives and processes necessary to deliver results in accordance with the specifications. Use some form of brainstorming or cause and effect diagramming (i.e., Ishikawa "fishbone") to determine the problem.
2. **Do.** Implement the processes and test the change, often with a small-scale study.
3. **Check.** Monitor and evaluate the processes and results against objectives and specifications and report the outcome. Review the test, analyze results, and identify what you have learned.
4. **Act.** Take action based on what you learned in the check step. Apply actions to the outcome for necessary improvement. Review all steps the (Plan-Do-Check-Act) and modify the process to improve it. If the change did not work, go through the cycle again with a different plan. If successful, incorporate what you learned into wider changes. Use what you learned to plan new improvements, beginning the cycle again.

An example helps make this clearer. In this example, the practitioner desires to improve their Incident Classification via use of diagnostics scripts. PDCA is the basic structure for the strategic planning, needs analysis, script design and delivery, staff goal setting and evaluation, provision of support services, and script training. The example shows the continuous cycle of designing diagnostics scripts and delivering them to staff. Improvement is not a separate activity but rather built into the work process.

- **Plan.** In this step, the practitioner examines and analyzes existing Incident Classification by examining previous Incidents. Because PDCA does not specify how to analyze data, a separate data analysis process may be used.
- **Do.** This example has two “do” steps. The first “do” seeks to match Classification with a diagnostic script. The practitioner plans the scripts by comparing what currently occurs with the desired state. The second “do” trials the changed process. Within set parameters, staff varies the usage of the script based on each calls unique requirements.
- **Check.** The “check” step includes formal and informal assessments taking place continually. If assessments show the scripts are not performing as expected, the practitioner can make changes such as re-instruction, changing the script or more direct staff mentoring. Assessment data becomes the input for the next step in the cycle.
- **Act.** The “act” step has the goal of standardizing the change. When staff meets the goals, the diagnostic script design and usage are standardized. Staff shares best practices in formal and informal settings. Results from this cycle become input for the “analyze” phase of the next cycle.

PDCA provides a framework for the improvement of a process. It can guide the entire improvement project, or to aid in developing specific projects based on identified target improvement areas.

PDCA is as a dynamic model. Completing one turn of the cycle flows into the beginning of the next. This continual cycle of change delivers ever-increasing improvement -- thus the name “ramp of improvement.”

You can apply the PDCA cycle to any situation. The PDCA cycle aids in assessing what needs to change and implementing an effective improvement plan.

FOCUS PDCA

FOCUS is an acronym for Find, Organize, Clarify, Uncover, and Start. FOCUS sets the stage for PDCA. FOCUS PDCA is then a nine-step process with five FOCUS steps, and 4 PDCA steps. Using the FOCUS method with PDCA can help you achieve higher quality results in less time.

The FOCUS steps are:

1. **F**ind an opportunity or process for improvement. Answer the question: What is wrong?
2. **O**rganize a team that understands the opportunity and related systems or processes. Answer the question: Who knows about this?
3. **C**larify the current opportunity or process with Ishikawa ("fishbone") diagrams or other means. Answer the question: What is involved?
4. **U**nderstand the causes of the inappropriate activity or results. Answer the question: Why isn't it working?
5. **S**tart the PDCA cycle by choosing a single modification to the process. Answer the question: Where should the change occur?

Using FOCUS helps you focus (pun intended!) on the right things to address using PDCA. Combining them into a nine-step process delivers an almost fool proof PDCA result.

PDCA Summary

- Try using the FOCUS method with PDCA.
- Use tools and techniques such as Fault Tree Analysis (FTA), Component Failure Impact Analysis (CFIA), Pareto Analysis and others to **Plan** to improve operations by determining what is going wrong and developing potential solutions.
- Use small groups and group management techniques to **Do** changes designed to solve the problems on a small or experimental scale first. This minimizes disruptions to routine work while the testing is underway.
- Trend Analysis, Critical Success Factors (CSF) and Key Performance Indicators (KPI) are critical to **Check** if the small scale or experimental changes are achieving the desired result or not. Continuously check key activities (regardless of any experimentation) to assess output quality at all times in order to identify new or potential problems.
- If the experiment was not successful, skip the **Act** stage, go back to the **Plan** stage to determine new ideas for solving the problem, and repeat the cycle.
- **Act** to document and implement the changes on a larger scale if the experiment is successful. Standardize the changes and make the changes the “new normal.” Involve stakeholders (staff, departments, suppliers, or customers) affected by the changes whose cooperation you need to implement on a larger scale.

  PDCA can produce some amazing results -- but only if you use it, and use it properly! As mentioned earlier, most executives claim they know how to use PDCA or a related QMS. Most executives also claim they use such a system. However, in reality most executives don’t actually follow the formal documented approach presented here.

  Try to FOCUS on PDCA to improve some aspect of one of your processes; you will be glad you did!