

PLAN DO CHECK ACT

QUALITY TOOLS PLAN DO CHECK ACT

Description of PLAN DO CHECK ACT

PDCA known as Deming Cycle or Deming Wheel, PDCA is a tool for continuous improvement of processes and products. Deming always referred to it as the "Shewhart cycle", PDSA (Plan-Do-Study Act). Deming modified it to PDCA because he felt that "check" emphasized inspection over analysis. Current Toyota Production System / Lean manufacturing uses OPDCA where "O" is taken for observation.

In Six Sigma programs, the PDCA cycle is called "define, measure, analyze, improve, control" DMAIC. The iterative nature of the cycle must be explicitly added to the DMAIC procedure

PLAN

Step to identify and analyze the problem. It focus on the objectives and processes necessary to achieve results in accordance with the expected output (the target or goals). By establishing output expectations, the completeness and accuracy of the requirements is also a part of the targeted improvement.

DO

Step to develop and test a potential solution. Implement the plan, execute the process, make the product. Collect data for charting and analysis in the following "CHECK" and "ACT" steps.

CHECK

Measuring how effective the test solution was, and analyzing whether it could be improved in any way. Study the actual results (measured and collected in "DO" above) and compare against the expected targets or goals from the "PLAN" . Record the deviations in implementation from the plan and also look for the appropriateness and completeness of the plan to enable the execution, All these information will be helpful for the next step "ACT".

ACT

Step to implement the improved solution fully. Initiate corrective actions on significant differences between actual and planned results. Analyze the differences to determine their root causes. Determine where to apply changes that will include improvement of the process or product. If the intended results are not achieved then look back for what went wrong and where the improvement is needed and apply those improvements in next PDCA cycle.

PDCA was made popular by Dr W. Edwards Deming who is considered by many to be the father of modern quality control; however, he always referred to it as the "Shewhart cycle". Later in Deming's career, he modified PDCA to "Plan, Do, Study, Act" (PDSA) because he felt that "check" emphasized inspection over analysis.^[5]

In Six Sigma methodology, the PDCA cycle is called "define, measure, analyze, improve, control" (DMAIC). The iterative nature of the cycle must be explicitly added to the DMAIC procedure.

The four phases in the Plan-Do-Check-Act Cycle involve iterating towards an improved and can be shown in figure below.



When to use the PLAN DO CHECK ACT

- 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.

How to use the PLAN DO CHECK ACT

1. Plan. Recognize an opportunity and plan a change.
2. Do. Test the change. Carry out a small-scale study.
3. Check. Review the test, analyze the results and identify what you've learned.

4. Act. Take action based on what you learned in the study step: If the change did not work, go through the cycle again with a different plan. If you were successful, incorporate what you learned from the test into wider changes. Use what you learned to plan new improvements, beginning the cycle again.

Tips on use of PLAN DO CHECK ACT

- All ideas to be reviewed for the problem solution or continuous improvement.
- Team members must be the representatives of the process area to be improved.
- Potential solutions to be tested in “Do” phase.
- Test results to be evaluated in “Check” Phase.
- "Do" and "Check" phases are to be iterated as many times as possible to collect the data.
- Evaluate data for target result achievement before the “Act” phase.
- Phase “Act” to be initiated only with polished and final solution.

Application of PLAN DO CHECK ACT

ABC Co. used PDCA cycle for one of their corrective action for oversize hub production from a line of automatic manufacturing machines.

PDCA is the basic structure for the district’s overall strategic planning, needs–analysis, process design and delivery, staff goal-setting and evaluation.

Objective:

- Catch the defective part before passing to the next operation,
- Look for all potential failure modes may cause the oversize condition.
- Identify the machine from the defective part produced.
- Correct the problem.

Plan:

- Detection of oversize part.
- Identify and problem resolution with the machine affecting part.

Do:

- Install an in line automatic gauge to catch oversize part.
- Signal automatic conveyor to stop which eventually stops machines.
- Inspect the tooling for all individual in line machines.
- Fix the tooling for the machine produced oversize part.

Check:

- Inspect and verify gauge dimension for its optimum function.

- Look for smooth and uninterrupted operation and inspection of in line gauge of conveyor.
- Verify for all potential failure modes may cause the oversize condition.
- Search for the best practice to be used for problem fixing upon fault detection.
- Collect all data for analysis and analyze them for optimum results.

Act:

- Upon having all good result from check stage, Implement the Plan.
- Congratulate the team.

References:

- World Class Quality, 2nd Edition by Keki R. Bhote & Adi K. Bhote
- Fast Track to Waste=Free Manufacturing by John W.Davis
- Out of the Crisis by W.Edwards Deming