

Title

A3 Owner:

**Background:**

**Goals / Objectives:**

**Current State Description:**

**Problem Analysis:**

**Countermeasures:**

**Plan Implementation / Update**

<b>Deliverables</b>	<b>Who</b>	<b>When</b>	<b>Status</b>

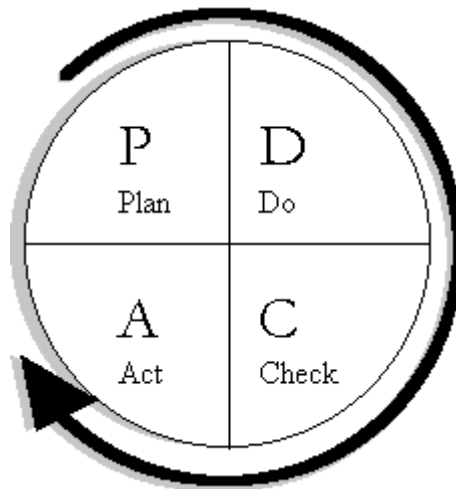
**Follow up and Recommendations / Replication:**

# PDCA Cycle

Topics From problem-faced to  
problem-solved  
Plan-Do-Check-Act  
Other references

## From problem-faced to problem-solved

The PDCA Cycle is a checklist of the four stages which you must go through to get from 'problem-faced' to 'problem solved'. The four stages are Plan-Do-Check-Act, and they are carried out in the cycle illustrated below.



The concept of the PDCA Cycle was originally developed by Walter Shewhart, the pioneering statistician who developed statistical process control in the Bell Laboratories in the US during the 1930's. It is often referred to as 'the Shewhart Cycle'. It was taken up and promoted very effectively from the 1950s on by the famous Quality Management authority, W. Edwards Deming, and is consequently known by many as 'the Deming Wheel'.

Use the PDCA Cycle to coordinate your continuous improvement efforts. It both emphasises 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.

Also use the PDCA Cycle diagram 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. How to use the PDCA Cycle diagram to choose the appropriate tool is explained in detail in the 'How to use it' section below.

## Plan-Do-Check-Act

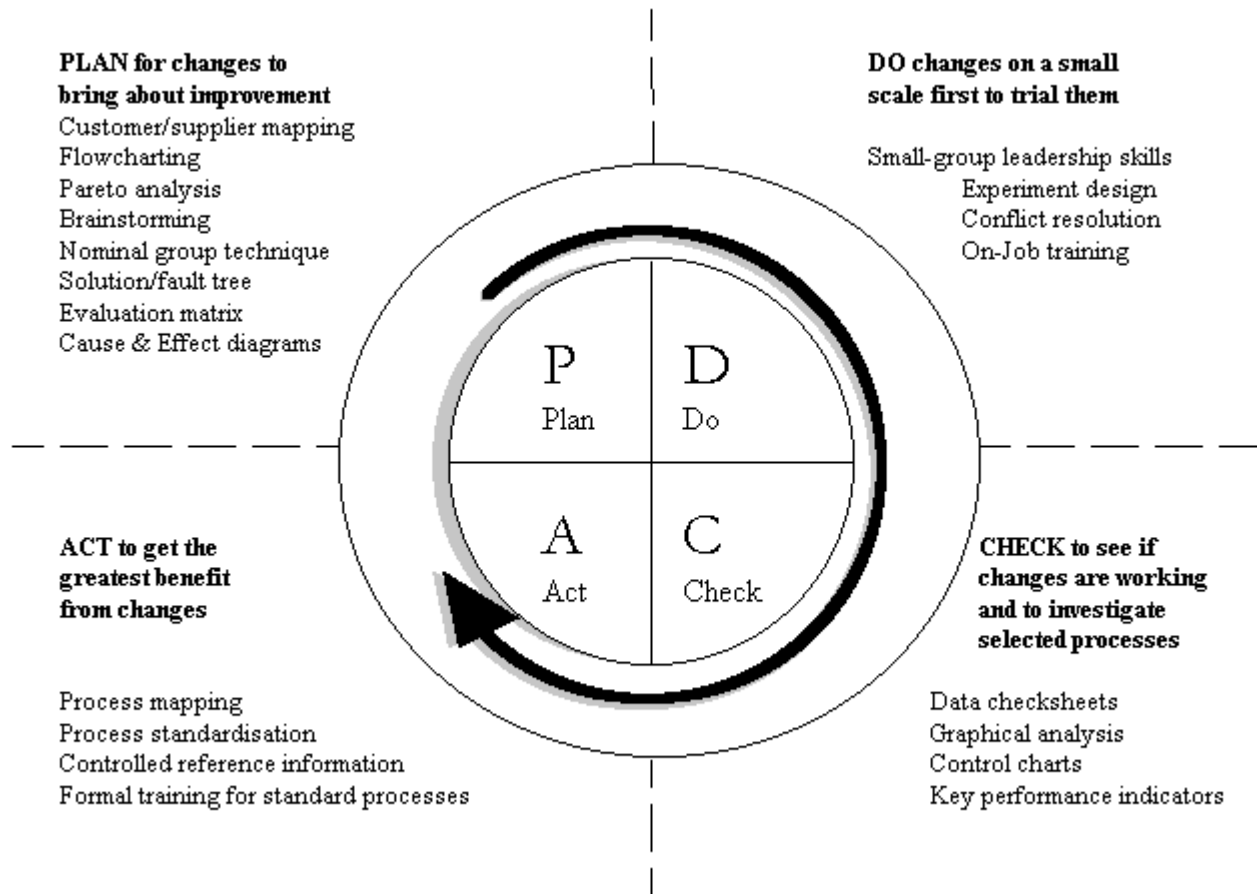
Here is what you do for each stage of the Cycle:

- **Plan** to improve your operations first by finding out what things are going wrong (that is identify the problems faced), and come up with ideas for solving these problems.
- **Do** changes designed to solve the problems on a small or experimental scale first. This minimises

- disruption to routine activity while testing whether the changes will work or not.
- **Check** whether the small scale or experimental changes are achieving the desired result or not. Also, continuously Check nominated key activities (regardless of any experimentation going on) to ensure that you know what the quality of the output is at all times to identify any new problems when they crop up.
- **Act** to implement changes on a larger scale if the experiment is successful. This means making the changes a routine part of your activity. Also Act to involve other persons (other departments, suppliers, or customers) affected by the changes and whose cooperation you need to implement them on a larger scale, or those who may simply benefit from what you have learned (you may, of course, already have involved these people in the Do or trial stage).

You have now completed the cycle to arrive at 'problem solved'. Go back to the Plan stage to identify the next 'problem faced'.

If the experiment was not successful, skip the Act stage and go back to the Plan stage to come up with some new ideas for solving the problem and go through the cycle again. Plan-Do-Check-Act describes the overall stages of improvement activity, but how is each stage carried out? This is where other specific quality management, or continuous improvement, tools and techniques come into play. The diagram below lists the tools and techniques which can be used to complete each stage of the PDCA Cycle.



This classification of tools into sections of the PDCA Cycle is not meant to be strictly applied, but it is a useful prompt to help you choose what to do at each critical stage of your improvement efforts.

# Dr. W. Edwards Deming

## 1900 - 1993

### The 14 Points

#### 1. Constancy of purpose

Create constancy of purpose toward improvement of product and service, with the aim to become competitive, to stay in business, and to provide jobs. American managers are usually concentrating on today's problems. But there's a whole range of issues for tomorrow, and without a plan for tomorrow, you will not be in business.

#### 2. Adopt a new philosophy

We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change. What's needed is the total demolition and transformation of the American style of management.

#### 3. Cease dependence on inspection to achieve quality

Eliminate the need for inspection on a mass basis by building quality into the product in the first place. Quality comes not from inspection, but from improvement of the process.

#### 4. End lowest tender contracts

End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust. Price alone seldom tells the story; it has no meaning without a measure of the quality being purchased.

#### 5. Improve every process

Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs. Everyone must understand the statistical thinking that guides improvement.

#### 6. Institute training on the job

Workers who learn their jobs from other workers, or from printed instructions, can't be relied on for top performance. A competent training program is the only answer.

#### 7. Institute leadership

The aim of leadership should be to help people do a better job, not to tell them what to do or punish them when they do wrong. Leadership of management is in need of overhaul, as well as leadership of workers.

#### 8. Drive out fear

Eliminate fear so that everyone may work effectively for the company. Workers should not be afraid to point out problems, ask questions or make suggestions. The economic loss from fear at all levels of the company is appalling.

#### 9. Break down barriers between departments

**"If I had to reduce my message for management to just a few words, I'd say it all had to do with reducing variation."**

Departments should not compete with each other or have conflicting goals. People in research, design, sales and production must work as a team. We should cooperate with each other, and compete with other firms.

#### **10. Eliminate exhortations**

Put an end to slogans, exhortations and targets for the work force asking for zero defects and new levels of productivity. Most slogans imply that workers could do better if they would only try. This offends, rather than inspires. Even worse, it often suggests that management doesn't understand the problems that are affecting production.

#### **11. Eliminate arbitrary numerical targets**

Eliminate work standards, and quotas on the factory floor. Eliminate management by objectives, management by numbers and numerical goals. Substitute leadership. The emphasis should be on quality, not on quantity.

#### **12. Permit pride of workmanship**

Remove barriers that rob workers and management of their right to pride of workmanship. Improve the system instead. This means abolishment of the annual or merit rating and eliminating management by objectives and numbers. Most people want to do a good job, and dislike it when something prevents them from doing it.

#### **13. Encourage education**

Institute a vigorous program of education and self-improvement for everyone. Management and workers must be educated in the new methods, including the importance of teamwork and statistical techniques.

#### **14. Top management commitment and action**

Put everybody in the company to work to accomplish the transformation. Workers can't do it alone, and neither can managers. The transformation is everybody's job. It takes courage to undertake transformation. Management must admit they have been wrong. Everyone must admit dissatisfaction with past performance. A critical mass of people must understand why change is necessary, and how this change will involve everyone.

### **The Seven Deadly Diseases**

The deadly diseases identified by Dr. Deming are truly having a negative impact on our society, worse today than when Dr. Deming was still with us.

- No constancy of purpose for the long-term.
- Emphasis on short-term profits.
- Performance appraisal systems.
- Management mobility.
- Relying on figures only.
- Excessive medical costs.
- Excessive liability costs.

#### Reference

Deming, W. E. (1986). *Out of the crisis*. Cambridge, MA: Massachusetts Institute of Technology.