

## Plan-Do-Check-Act (PDCA) Cycle: The Goal towards continuity

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**Abstract:** On account of the day to day rapid increase in competition for consumer markets has led many companies to re-evaluate their operations. In the search for the identification of more adequate methods to elaborate products or services, those now needs to map processes and to determine their management tools as also a company needs to transform raw materials into products that meet it's consumer market requirements and here comes the need of following PDCA (Plan-Do-Check-Act) cycle to reach the new changing demands of consumer-market and for the control and continual improvement of process and products. The PDCA (Plan-Do-Check-Act) model is a proven framework for implementing continuous quality improvement. These four steps provide the framework for continual improvement. The PDCA cycle basically starts with a Plan and ends with an Action in accordance to the information learned during the process. The aim of writing this article is to implement Plan-Do-Check-act (PDCA) cycle as a method for the continuous quality improvement in the various companies and industries. This method is used to identify and analyze the critical problems that occur in the pre-analytical stage of manufacturing, servicing, improving, producing and developing, to find the root causes of their occurrence and proffer solutions. Thus PDCA methodology can be successfully applied in the respective zones and fields to reduce the occurrence of errors and increase the process capability to enhance the efficiency and effectiveness of the work.

**Keyword :** PDCA cycle, it's origin, why and when to use PDCA cycle, PDCA cycle procedures, PDCA application in field of Safety, Case study.

**Objective:** Objective to write this Article is to know and use PDCA Cycle in Safety Management system to control risk and ensure safe healthy work environment.

**Introduction:** "Necessity is the mother of invention"—With the conception and explanation of the 4Rs of the psychology of human brain associated with- Reading/Learning, Retention, Recalling and Recognition, there developed an iterative four step management method used in various purpose of business and in several organization for the control and continuous improvement of process and products which emerged as PDCA (Plan-Do-Check-Act or Plan-Do-Check-Adjust) cycle. It is also known as the Deming cycle/wheel/circle or Shewhart cycle, the control cycle or PDSA (Plan-Do-Study-Act) cycle. PDCA cycle has another version named "OPDCA". The 'O' symbolizes for observation or as the same version say: " We need to observe the current condition". This emphasize on observation and current condition. Walter Shewhart emerged as the father of PDSA (Plan-Do-Study-Act) who is a renowned American Statistician and physicist. He was passionate about statistical analysis and quality improvement and he proposed the PDSA cycle in the year of 1930. Years later, inspired by Shewhart's ideas , William Edward Deming actually developed the model into a learning and improvement cycle in the year of 1951 which became popular as PDCA (Plan-Do-Check-Act) cycle. Thenceforth we know this model as Shewhart cycle or Deming cycle. PDCA cycle involves systematically testing possible solutions, assessing the results and implementing the ones that have shown to work. It investigates and puzzles out problems by systematic and scientific approach. PDCA cycle enables a qualitative and quantitative approach for solving problems and managing change in each step. It helps businesses to develop certain plans about what needs to change , test these plans in a continuous feedback loop and gain valuable learning and knowledge. It enhances testing improvements on a small scale before updating company-wide procedures and work methods or statements.

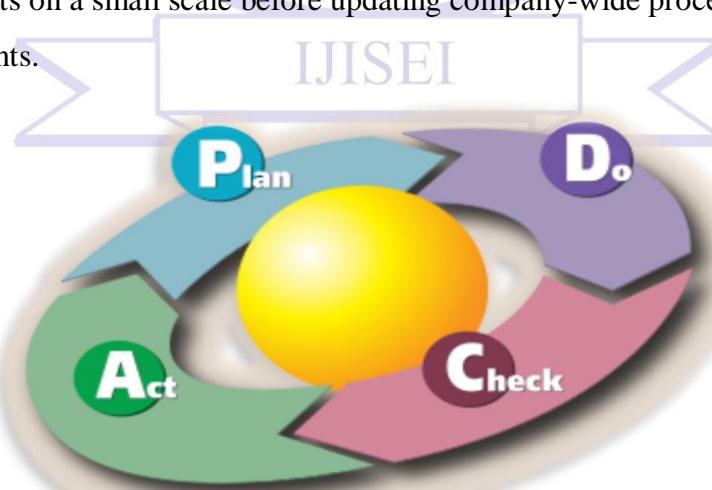


Figure:1, The PDCA cycle

## 2. Why to use PDCA Cycle??

PDCA (Plan-Do-Check-Act) cycle is a useful tool that can help the team solve problems much more efficiently. It is a continuous loop of planning, doing, checking (or studying) and acting which provides a simple and effective approach for solving problems and managing change and it is very much essential for carrying out improvement measures on a small scale before updating procedures and working methods. It works towards the Leadership goals and functions for the development of the organization in the Safe Operation Procedure (SOP), it works for the steady improvement in production and also minimizes the potential accident or incident. Moreover PDCA (Plan-Do-Check-Act) cycle stimulates continuous improvement of people and process, it lets the team test possible solutions on a small and in a controlled environment. It thus prevents the work from recurring mistakes.

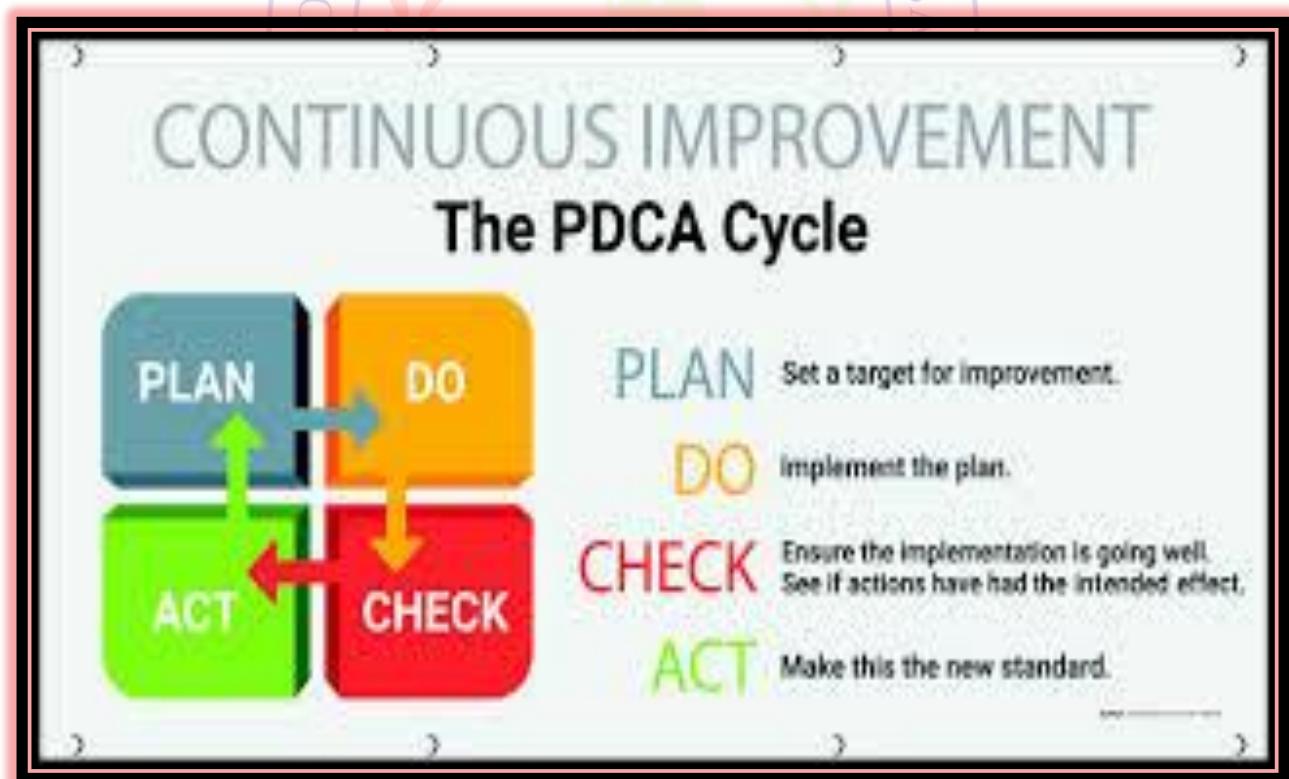
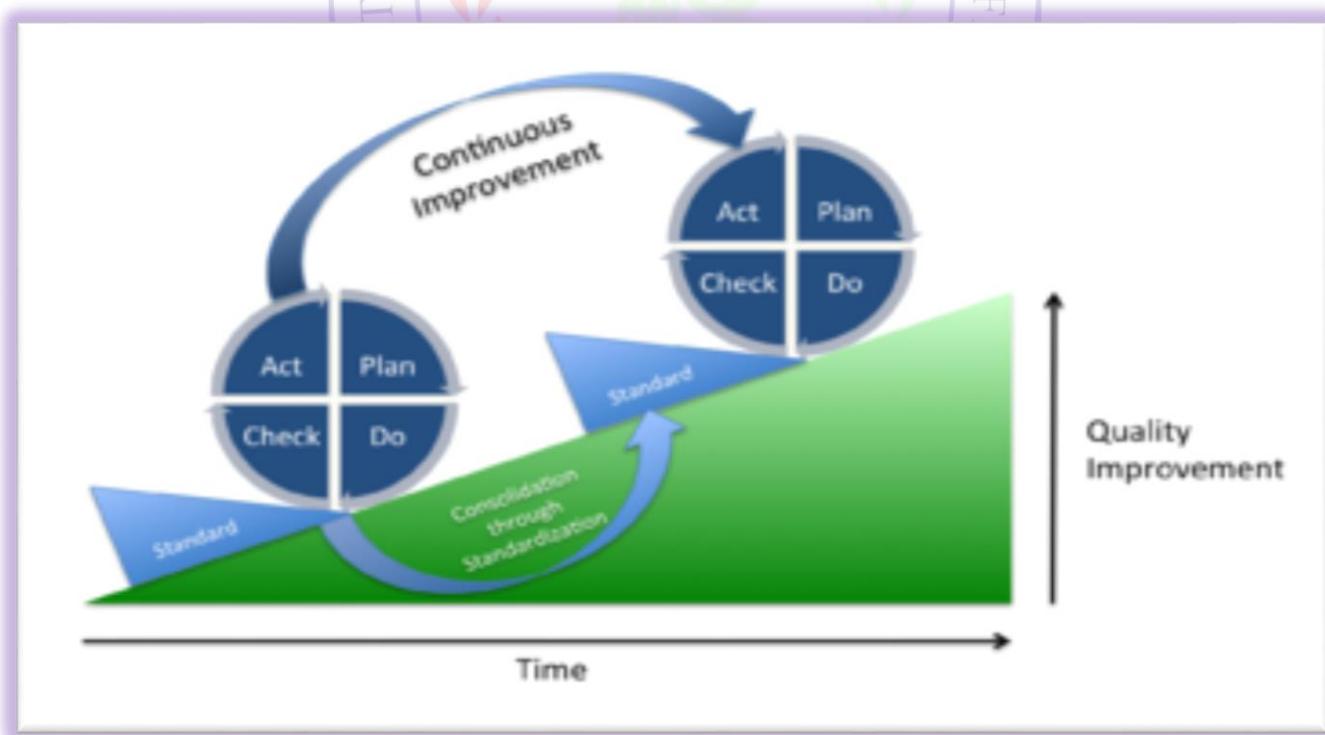


Figure: 2, showing continuous improvement of PDCA cycle

### 3. When to use PDCA Cycle??

As a circle moves in a clockwise direction with a never ending rounds, the PDCA (Plan-Do-Check-Act) cycle is a never ending continuous improvement process which involves Plan, Perform, Monitor and Improve. There are some specific situations and places where this cycle can be implemented towards the mode of achieving the specific number of goals. The following measures are to be considered as the appropriate time for using PDCA Cycle:

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



**Figure: 3, representing continuous quality improvement of PDCA cycle with respect to time.**

## 4. Plan-Do-Check-Act (PDCA) Procedures

On evaluating the acronym of PDCA we get PLAN, DO, CHECK and ACT each of which suggesting various meanings and measures required to fulfill any goal effectively and completely.

**4.1 PLAN (P):** PLAN suggests PLAN and POLICY. An effective way of planning can only be achieved through coordinate action by all members of the organization. Hence members from various departments with various forms of knowledge and skills form a team named as Cross Function Team (CFT) and set up an Object and Goal according to SMART (Specific Measurable Achievable Relevant Time-bound) theory. After they have successfully completed this goal, before moving on to further development of the work, the problem must be defined according to 5W2H ( Why, When, What, Where, Who, How, How many) form questions and should be fact-find, where after thorough discussions, researches and investigations of the problems CFT should suggest suitable measures to it that is, brainstorming the potential cause of the problem and identify and agree the potential root cause.

**4.2 DO (D):** DO expresses RISK ASSESSMENT and IMPLEMENT PLAN. After identifying the potential hazards and typical problems, the initial step comes with describing the solution of the problem keeping in mind the Likelihood or probability and consequences or Severity of the steps to be followed while solving the potential cause of the problem and providing a solution to it. After describing the solution to the problem, team should try and test the solution in the form of try-test method and it is advisable to carry out a small scale pilot project. The purpose of following these steps are to identify the unsafe practices (unsafe act or unsafe condition) (if any) found while continuing with the cycle. The result should then be measured accurately and recorded for next reference.

**4.3 CHECK (C):** CHECK evaluates COLLECTION OF DATA and MEASURING PERFORMANCE. Collection of data is usually carried out by Active monitoring and Reactive monitoring. Active monitoring is specially supervised through proper education and training, a thorough inspection and survey and also by performing Risk Assessment and maintaining other

suitable control measures which can be easily followed. Reactive monitoring is maintained and carried out after the incident or accident. It specially indicates for the accident and incident report. For the further development of the cycle, the results after being measured should be studied out vastly by investigating each steps, clues and solutions and the effectiveness of the results must be measured. The team should then communicate to find the improvement and effectiveness of the solutions provided as how this solution is being applied in the practical or relevant field and it's merits and demerits affecting in this field. After working on the communication in the relevant field, team should supervise and take necessary action on getting the feedback from the same.

**4.4 ACT (A):** ACT or ACTION works towards REVIEW, LEARN and LESSON. Action clearly justifies the solution to be reviewed efficiently to determine the safe working or operation procedure that is it checks and ensures for the cycle to be followed regularly and properly. If the PDCA cycle is found to be working successfully then it should be implemented towards the continuous improvement of the project. While if the cycle is turns out unsuccessful, it should be properly taken care about the faulty work habits being followed and the PDCA cycle should be followed again and again to make the project successful.

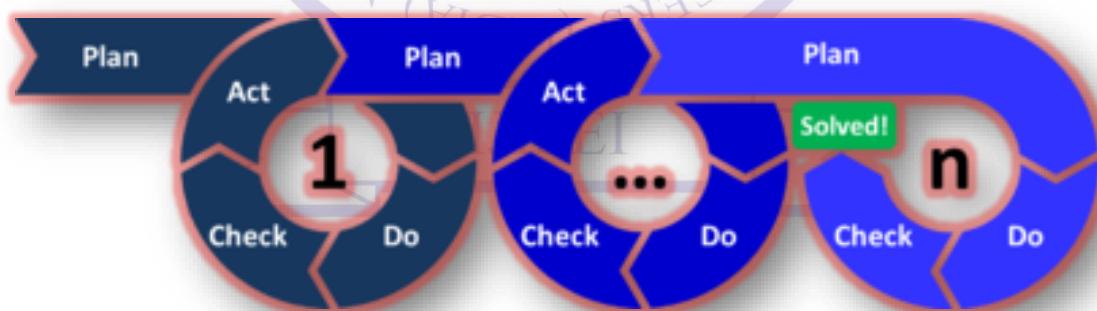


Figure: 4, PDCA procedures

## 5. PLAN-DO-CHECK-ACT (PDCA) Sensible Example

Here the PDCA cycle is employed as a model version for elaborating the work procedures by ST. PAUL'S ACADEMY, BWN District.

The PDCA model is that the easy structure for the district's:

- To actively participate within the effective coming up with and communication
- Develop and recommend varied analysis
- Curriculum planning and delivering directions
- Evaluation of the course of study and workers goal-setting
- Provision of student services and support services
- Classroom instruction over vital topics

Basically it results in a 'Classroom Success.' It could be a continuous cycle of planning Progress reports, course of study and delivering varied schoolroom instruction. we have a tendency to should detain mind that improvement isn't a distinct activity. It ought to be engineered into the work method.

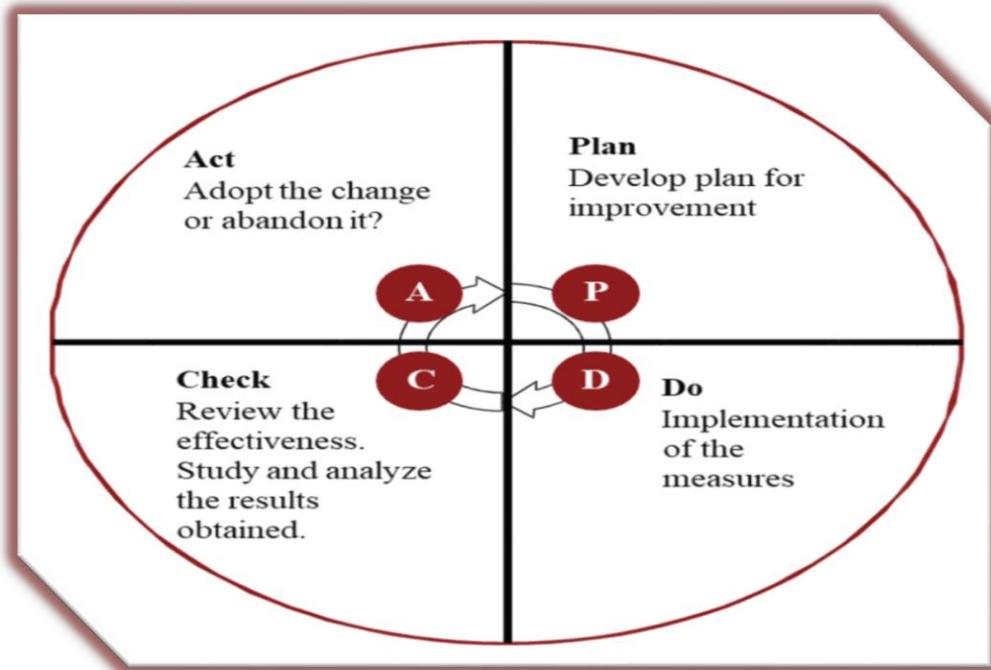


Figure: 5, Plan-do-check-act

## 5.1 Plan

The First Approach commences with a "plan" step, named "analyze." during this step, students' desires area unit analyzed by examining a spread of information out there. the info analyzed includes everything from every grades to overall performance on standardized tests. knowledge is analyzed for individual students by results, gender, or the other subgroup. this can be as a result of PDCA doesn't specify the thanks to analyze or choose knowledge, a separate knowledge analysis method is employed here furthermore as in alternative processes throughout the organization.

## 5.2 Do

The Second Approach continues with Two (2) "do" steps:

1. The "align" step asks what the national and state standards need and the way they're going to be assessed. academics set up course of study activities by making certain the topics that area unit instructed earlier and later they grade levels to make sure a transparent continuity of instruction throughout the student's schooling. academics facilitate to develop individual goals to enhance their instruction wherever the "analyze" step showed any gaps.
2. The "act" step is wherever instruction is provided, following the course of study and teaching goals. inside restricted parameters, academics advise and guide the scholars primarily based on every student's learning rates and designs.

## 5.3 Check

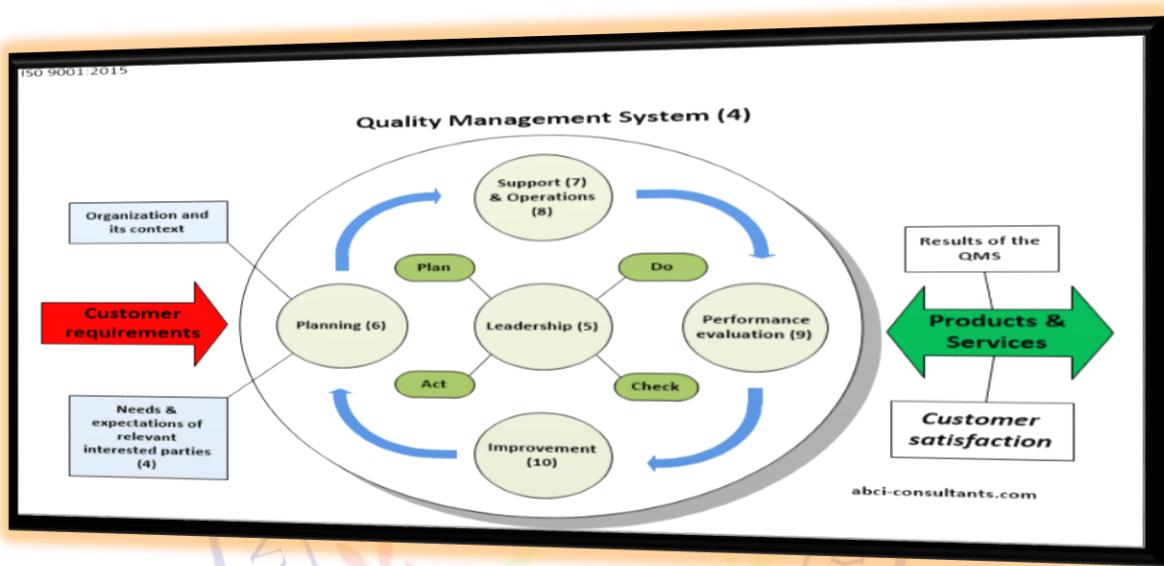
Teachers build formal and informal assessments from daily reviews to six-week progress reports to annual standardized tests. academics may access comparative knowledge on the on-line database to spot trends. poor students area unit monitored by a special kid study team.

Throughout the varsity year, if the assessments and progress reports show that students don't seem to be learning needless to say, mid-course corrections area unit created (such as revision of the topics, re-instruction, dynamical teaching strategies, and a lot of direct teacher mentoring).

Assessment knowledge become input for following method within the cycle.

## 5.4, Act

In this example, the "act" symbolizes "standardization." once the goals area unit achieved, the course of study style and teaching strategies area unit thought-about standardized. academics share their best practices in formal and informal settings. Results from this cycle become input for the "analyze" part of following Approach cycle.



**Figure: 6, The PDCA quality management system, Ref. ISO 9001**

**6. Conclusion:** Normally terms, it's over that the PDCA cycle could be a tool that facilitates the detection of improvement opportunities, furthermore because the development and implementation of identical in several company and business producing comes. PDCA cycle could be a technique {|methodology} for quality management that has been wide utilized in varied fields and it's advisable to use this scientific well-tried method by following it's applicable steps and procedures towards providing the framework for continuous improvement of method and merchandise.

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