PDCA, DMAIC, A3, 8D/PSP – What are the differences? Explained By Gabriel Daniels PE. Lean Six Sigma Master Black Belt

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Problem-solving approaches is bit challenging, but there are not so many differences between these approaches, as one could expect. All differences are depending only on the type of problem, which has to be solved.

There are various problem-solving approaches, most common techniques are, PDCA, DMAIC, A3, 8D/PSP and most OEM have their own propriety forms and format. What problem-solving technique should be deployed? it all depends and can be sorted into the following categories:

1. Is it a small, medium or large sized problem you want to solve?

2. Problem-solving strategy for external "Corrective Action Request" from 1st, 2nd or 3rd party auditor or a customer complaint? (This could be a written complaint in the form of NC, NCR, CAR)

3. "Continuous Improvement" (in pursuit of perfection!), problem-solving strategy.

All these approaches have in common, that they follow a scientific and methodic way to solve the problem. In addition to that, the different phases of each approach can be mapped to the phases of the other ones (please see table below).

| PDCA	DMAIC	A3	8D/PSP
Plan	Define	Clarify the Problem	1. Create Team & collect Information
	Measure	Break down the Problem	2. Describe the Problem
		Set a Target	3. Define Containment Actions

Do	Improve	Countermeasures	6. Implement corrective Actions
Check	Control + Follow	Evaluate Results & Processes	7. Define Actions to avoid Recurrence
Act		Standardize Success	8. Congratulate your Team

🖉 Write an

PDCA: The PDCA-Cycle, also called the Deming-Cycle or Shewhart-Cycle, is the classic problem-solving approach in a LEAN environment. PDCA is used for medium-sized problems and the Act-phase implies that the PDCA-Cycle should start again in the sense of a continuous improvement process. The Plan-phase should be done very carefully and therefore should consume at least 50% of the total time of the PDCA.

DMAIC: The origin of the DMAIC problem-solving approach is the Six Sigma.
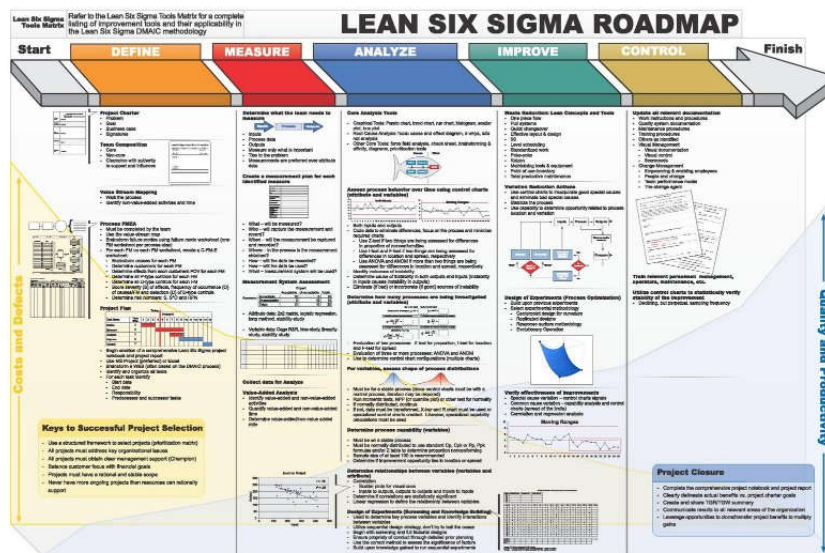
DMAIC: The origin of the DMAIC problem-solving approach is the Six Sigma world. Basically, it is a 5-Step PDCA used for large problems where typically a huge amount of data is available. Therefore DMAIC is often related to statistic tools, but this does not have to be. The duration of a DMAIC project may exceed more than three months, dependent on the complexity of the problem and process to be improved.

A3: The A3-Report, developed by Toyota, is an 8-step PDCA that should fit on an A3 sheet of paper. It is a collaborative and visual tool (graphs should be included). The A3 is also used for solving medium-sized problems, which can be solved in approx. one week or less. A3-Reports are very common in the LEAN world.

8D/PSP, The 8D Problem Solving Process, or 8D-Report: It is an 8-step PDCA with the focus on fast reaction to customer complaints (e.g. a delivered component or product failed at the customer or in the field). Typically, the first three steps should be accomplished and reported to the customer in three days. Basically, PSP is the same thing like the 8D but used in aerospace industries.

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your own form/format. As the 8D/PSP (Eight Disciplines of Problem S
template/documentation is already established, just complete the 8D fo
complete all required actions.

IMHO 8D/PSP is the most comprehensive approach to problem-solvin
satisfies most customer and auditors as well as, the PDCA, PDSA, DM
solving processes.

Eight Disciplines (8D)

The eight disciplines (8D) model is a problem-solving approach, typica
quality engineers or other professionals and most commonly used by t
automotive industry.

The approach establishes a permanent corrective action based on statistical analysis of the
problem and focuses on the origin of the problem by determining its root causes. Although it
originally comprised eight stages, or disciplines, it was later augmented by an initial
planning stage, so mathematically there are 9D's.

The 8 disciplines are:

- D0: Plan—Plan for solving the problem and determine the prerequisites.

- D1: Use a team—Establish a team of people with product/process knowledge.

- D2: Define and describe the problem—Specify the problem by identifying in
  quantifiable terms the who, what, where, when, why, how, and how many (5W2H) for
  the problem.

- D3: Develop interim containment plan; implement and verify interim actions—Define
  and implement containment actions to isolate the problem from any customer.

- D4: Determine, identify, and verify root causes and escape points—Identify all
  applicable causes that could explain why the problem occurred. Also, identify why the
  problem was not noticed at the time it occurred. All causes shall be verified or proved,
  not determined by fuzzy brainstorming. One can use 5 Whys and cause and effect
  diagrams to map causes against the effect or problem identified.

- D5: Choose and verify permanent corrections (PCs) for problem/nonconformity—
  Through pre-production programs, quantitatively confirm that the selected correction
  will resolve the problem for the customer.

- D6: Implement and validate corrective actions—Define and implement the best
  corrective actions.

- D7: Take preventive measures—Modify the management systems, operation systems,

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Change is hard because people overestimate the value of what they have and underestimate the value of what they may gain by giving that up, yet if you always do what you've always done, you'll always get what you've always got.

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I like this **Richard C. A. Barr** ! Where did this method come from?

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Hi Gabriel,

This is how I have tried to conduct my work, utilising a process like this...maybe not always on paper, but in my head anyway.

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