

Eight Disciplines Problem Solving

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June 13, 2026

RECOMMENDED CITATION

mohammad looti (2026). *Eight Disciplines Problem Solving*. PSYCHOLOGICAL SCALES.
Retrieved from <https://scales.arabpsychology.com/?p=38337>

Eight Disciplines Problem Solving is a method used to approach and to resolve problems, typically employed by quality engineers or other professionals.

D0: The Planning Phase: 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: Developing Interim Containment Plan Implement and verify Interim Actions: Define and implement containment actions to isolate the problem from any customer.

D4: Determine and Identify and Verify Root Causes and escape points: Identify all potential causes that could explain why the problem occurred. Also identify why the problem has not been noticed at the time it occurred. All causes shall be verified or proved, not determined by fuzzy brainstorming.

D5: Choose and verify Permanent Corrective Actions (PCAs) for root cause and Escape point : Through pre-production programs quantitatively confirm that the selected corrective actions will resolve the problem for the customer.

D6: Implement and validate PCAs: Define and Implement the best corrective actions.

D7: Prevent recurrence: Modify the management systems, operation systems, practices and procedures to prevent recurrence of this and all similar problems.

D8: Congratulate your Team: Recognize the collective efforts of the team. The team needs to be formally thanked by the organization.

8D has become a standard in the Auto, Assembly and other industries that require a thorough structured problem solving process using a team approach.

History

People have been using structured problem solving methodologies since the Dark Ages. No single source can claim to be the fountain of modern problem solving techniques. Ford Motor Company developed a method, while the military also developed and quantified their own process during World War II. Both of these methods revolve around the Eight Disciplines.

Ford's Perspective

The development of a Team Oriented Problem Solving strategy, based on the use of statistical methods of data analysis, was developed at Ford Motor Company. The executives of the Powertrain Organization (transmissions, chassis, engines) wanted a methodology where teams (design engineering, manufacturing engineering, and production) could work on recurring problems. In 1986, the assignment was given to develop a manual and a subsequent course that would achieve a new approach to solving tough engineering design and manufacturing problems. The manual for this methodology was documented and defined in "Team Oriented Problem Solving" (TOPS), first published in 1987. The manual and subsequent course material was piloted

at World Headquarters in Dearborn, Michigan. Many changes and revisions were made based on feedback from the pilot sessions. This has been Ford's approach to problem solving ever since. It was never based on any military standard or other existing problem solving methodology. The material is extensive and the 8D titles are merely the chapter headings for each step in the process. Ford also refers to their current variant as G8D (Global 8D).

Military Usage

The US Government first standardized a process during the Second World War as Military Standard 1520 'Corrective Action and Disposition System for Nonconforming Material'. This military standard focused on nonconforming material and the disposition of the material.

The 8D Problem Solving Process is used to identify, correct and eliminate recurring problems. The methodology is useful in product and process improvement. It establishes a permanent corrective action based on statistical analysis of the problem. It focuses on the origin of the problem by determining Root Causes.

This 'Determine a Root Cause' step is a part of the military usage of the 8D's but was not a reference in the development of the 8D problem solving methodology and is not referenced or included in the TOPS manual or course.

Usage

Many disciplines are typically involved in the "8D" process, all of which can be found in various textbooks and reference materials used by Quality Assurance professionals. For example, an "Is/Is Not" worksheet is a common tool employed at D2, and a "Fishbone Diagram" or "5 Why Analysis" are common tools employed at step D4.

In the late 1990s, Ford developed a revised version of the 8D process, that they call "Global 8D" (G8D) which is the current global standard for Ford and many other companies in the automotive supply chain. The major revisions to the process are as follows:

Addition of a D0 (D-Zero) step as a gateway to the process. At D0, the team documents the symptoms that initiated the effort along with any Emergency Response Actions (ERAs) that were taken before formal initiation of the G8D. D0 also incorporates standard assessing questions meant to determine whether a full G8D is required. The assessing questions are meant to ensure that in a world of limited problem-solving resources, the efforts required for a full team-based problem-solving effort are limited to those problems that warrant these resources.

Addition of Escape Point to D4 through D6. The idea here is to consider not only the Root cause of a problem, but equally importantly, what went wrong with the control system in allowing this

problem to escape. Global 8D requires the team to identify and verify this Escape Point (defined as the earliest control point in the control system following the Root Cause that should have detected the problem but failed to do so) at D4. Then, through D5 and D6, the process requires the team to choose, verify, implement, and validate Permanent Corrective Actions to address the Escape Point.

Recently, the 8D process has been employed significantly outside the auto industry. As part of Lean initiatives and Continuous Improvement Processes it is employed extensively within Food Manufacturing, High Tech and Health Care industries.

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