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Overview of Problem Solving

Throughout this course, you learn how to use the principles of statistical thinking to solve problems. For the sake of this course, we define a problem as "a failure to meet the desired level of performance."

Or, stated differently, a problem is a gap, either real or perceived, between the existing state and the desired state. Problem solving, then, is a systematic approach to finding solutions to problems.

There are many problem-solving methodologies that are built on the principles of statistical thinking. Four commonly used methodologies, or processes, are PDSA, DMAIC, A3, and 8D. The approach that you use is largely based on your company's overall approach to quality improvement.

For instance, you might be familiar with total quality management, Six Sigma, and lean manufacturing. But there are many others. These programs are usually company-wide initiatives. They guide both the management philosophies towards quality improvement and the problem-solving methodologies used across the organization. For example, DMAIC, which is the acronym for Define, Measure, Analyze, Improve and Control, is the typical methodology used in Six Sigma to solve problems.

Likewise, the A3 approach, which was developed by Toyota, is typically used by companies that follow lean manufacturing practices. It is called A3 because the resulting eight-step report fits on one sheet of A3 paper. 8D, the Eight Disciplines, was developed by Ford Motor Company in the 1970s but has since become popular in a wide variety of industries. Perhaps the oldest approach is PDSA (Plan, Do, Study, Act) or PDCA (Plan, Do, Check, Act).

This is based on the scientific method and was popularized by quality gurus Walter Shewhart and W. Edwards Deming. If you're interested in learning more about these problem-solving methodologies and the various quality improvement initiatives, see the Read About It for this module.

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