Calculating the Sigma Level

The Sigma Level provides a high level baseline metric to understand the capability of a process (or entire organization) to meet customer requirements. When calculating the Sigma performance level for a product or process, the metric Defects Per Million Opportunities (DPMO) is generally used.

When is it used?

• Calculated in the Measure phase of the DMAIC process.
• May be used again throughout the DMAIC process according to the questions that must be answered, such as:
  • How does the overall organization compare to other organizations?
  • How does a specific process compare to other processes, even if they have different levels of complexity?
  • What is the baseline performance of an organization or specific process prior to improvement actions?
  • Did the improvement actions have an impact on performance?

How to Calculate the Sigma Level

1. Determine the number of units produced.
2. Determine the number of defect opportunities per unit.
3. Count the number of defects.
4. Calculate DPMO using the formula.

\[
DPMO = \frac{(\# \text{Defects})x(1,000,000)}{(\# \text{Defect Opportunities / unit})x(\# \text{Units})}
\]

Exercise

A toaster is determined to have 52 opportunities for a defect. In a recent audit of 1000 randomly selected toasters, a total of 975 defects were found. What is the Sigma level of the toaster manufacturing process?

\[
DPMO = 18,750
\]

Sigma Level = 3.6

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