

The Six Sigma Methodology

Six Sigma is one of the most well-known quality improvement methodologies, and it represents the latest incarnation of the quality movement to date. It is a structured program for improving product and process quality by pinpointing and removing inconsistencies in the manufacture and delivery of products and services. Sigma (σ) is the mathematical symbol for standard deviation and is a measure of variability. Variation is the cause of unstable processes, which leads to poor quality and unsatisfied customers. Therefore, the goal of the Six Sigma process is to reduce variation such that performance up to 6 standard deviations from the mean will fall into the customer's desired specification limits (i.e. tightly controlled process variation).

In the 1980's Motorola embarked on a strategic plan to reduce the number of defects in its own products and called this process Six Sigma. Today, Six Sigma follows a strict methodology known as DMAIC (Define, Measure, Analyze, Improve, and Control) and consists of different levels of training including Green Belt and Black Belt. According to estimates, most service or manufacturing environments generally operate at 4 sigma, which allows 6,000 defects per million operations of a process. Yet, a Six Sigma process results in a spread of no more than +/- 6 standard deviation between the mean and the specification limits, which results in no more than 3.4 defects per million opportunities "virtually defect free performance."