

## Six Sigma

Six-Sigma refers to a quality improvement and business strategy concept started by Motorola, USA in 1986. In statistical terms, Six-Sigma is the abbreviated form of 6 standard deviations from the mean. Six-Sigma is a set of methodologies used by businesses to achieve extremely low failure rates in any process. It provides the techniques and tools to improve the capability and reduce the defects in any process.

Each Six Sigma project carried out within an organization follows a defined sequence of steps and has quantified financial targets (cost reduction or profit increase). A six sigma process is one in which 99.99966% of the products manufactured are statistically expected to be free of defects (3.4 defects per million opportunities or 3.4 DPMO).

Six Sigma projects follow two methods inspired by Deming's Plan-Do-Check-Act Cycle.

### **DMAIC**

*Define* the problem

*Measure* key aspects of the current process

*Analyze* the data to investigate and verify cause-and-effect relationships

*Improve* the current process based upon data analysis using techniques.

*Control* the future state process to ensure that there is no deviations from target.

### **DMADV or DFSS**

*Define* design goals that are consistent with customer demands.

*Measure* and identify CTQs (characteristics that are **Critical To Quality**),

*Analyze* to develop and design alternatives

*Design* details, optimize the design, and plan for design verification.

*Verify* the design, set up pilot runs, implement the production process and hand it over to the process owner(s).