Image 34: The Philosophy of Six Sigma

The Philosophy of Six Sigma

1. Businesses lose money in way of undesired things happening within the processes (poor quality) – that is accounted as Cost of Poor Quality (***CoPQ***).
2. Any such undesired result is called a ***defect*** and caused by variation in process or processes. Such process variations need to be minimised and controlled to check the losses.

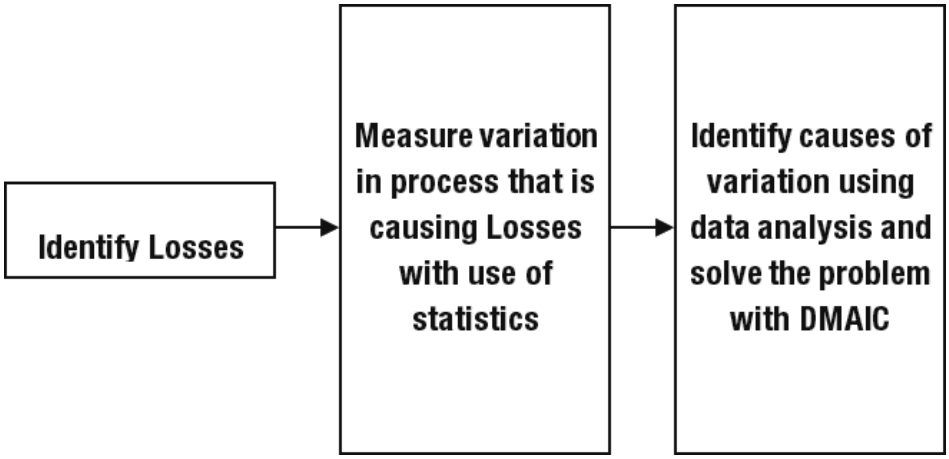

Image 35: Principles of Six Sigma

The Principles

1. Understand where an organisation loses its profit and measure variations in associated processes, using statistics.
2. Apply statistical models to explain the reason for variations and find out solutions to minimise those variations.
3. Use a robust framework (DMAIC) to steer the process of understanding the losses (D), measurement of process variations (M), attributing those variations to the certain phenomena of the process (A), find out solutions using statistics (I) and to ensure sustenance of solutions (C).

The Practices (Tools)

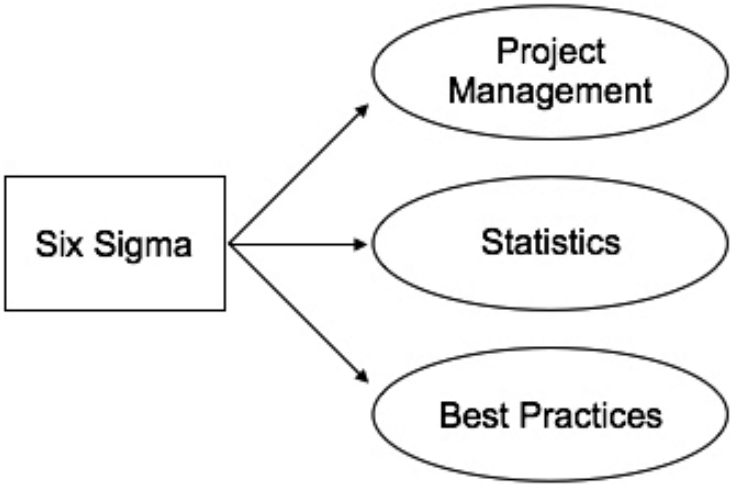

Image 36: The Components of Six Sigma

Being a dynamic and widely applied methodology, Six Sigma is constantly expanding its coverage of tools and best practices. In my personal opinion, most of the practices in Six Sigma today are a better combination of tools related to Statistics, Project Management, and other Best Practices. We can classify some tools as below. I am listing most of the tools at Green Belt level for Six Sigma, though it may not be an exhaustive list.

Project Management Tools in Six Sigma

- DMAIC framework
- Voice of customer
- Yield analysis
- Affinity analysis
- Kano model
- Prioritisation using Pareto chart
- Problem definition
- Project charter
- Business case
- Goal statement
- Scope
- Team responsibilities

- Communication plan
- Stakeholder analysis
- RACI matrix
- Steering committee review
- Champions training
- Master / Black belt reviews
- Operational definition
- Measurement system analysis
- Prioritisation of root cause
- Validation of root cause
- Effort benefit analysis
- Implementation action plan
- Control plan

Statistical Tools in Six Sigma

- Sampling
- Data collection
- Data display
- Data screening (trend & stability analysis)
- Statistical model selection (normal / non-normal)
- Descriptive statistics
- Inferential statistics
- Gage R & R / Attribute agreement analysis
- Process capability
- Data analysis
- Regression analysis
- Hypothesis testing
- Design of experiments
- Control chart

Best Practices in Six Sigma

- 5W 2 H for definition
- SIPOC analysis
- Process flow charts
- Cause and effect analysis
- Why-why analysis
- Brainstorming
- Failure Mode and Effect Analysis
- Solution Generation techniques
- Poka-Yoke*
- 5S
- SMED
- TRIZ*
- KPI*
- Dashboards

Poka-Yoke or mistake-proofing is a mechanism of preventing errors becoming defects. Seat belt warning in cars is an example of poka-yoke. Here, the driver is warned / informed about the mistake of not wearing seat belt.

TRIZ – It is one of the advanced problem solving methodologies. TRIZ is an abbreviation of a Russian term meaning 'Theory of Inventive Problem Solving'. According to TRIZ, a problem is only a contradiction between two of 39 predefined parameters and there are only 40 solutions available for all such contradictions. It is predominantly used in Engineering industry.

KPI – Meaning Key Performance Indicators. These are some of the indicators of a process to measure how well the process is being performed.