pdf Six Sigma™

Lean Six Sigma Black Belt Training

Featuring Examples from Minitab 16

1.0 Define Phase

Black Belt Training: Define Phase

1.1 Six Sigma Overview

- 1.1.1 What is Six Sigma
- 1.1.2 Six Sigma History
- 1.1.3 Six Sigma Approach Y = f(x)
- 1.1.4 Six Sigma Methodology
- 1.1.5 Roles & Responsibilities

1.2 The Fundamentals of Six Sigma

- 1.2.1 Defining a Process
- 1.2.2 VOC & CTQ's
- 1.2.3 Cost of Poor Quality (COPQ)
- 1.2.4 Pareto Analysis (80:20 rule)

1.3 Lean Six Sigma Projects

- 1.3.1 Six Sigma Metrics
- 1.3.2 Business Case & Charter
- 1.3.3 Project Team Selection

1.4 Lean Fundamentals

- 1.4.1 Lean & Six Sigma
- 1.4.2 History of Lean
- 1.4.3 The Seven Deadly Muda
- 1.4.4 Five-S (5S)

1.1.3 Six Sigma Approach

Six Sigma Approach: Y = f(x)

- The Six Sigma approach to problem solving uses a transfer function.
- A transfer function is a mathematical expression of the relationship between the inputs and outputs of a system.
- **Y=f(x)** is the relational transfer function that is used by all Six Sigma practitioners.
- It is absolutely critical that you understand and embrace this concept.

$$Y = f(x)$$

Six Sigma Approach: Y = f(x)

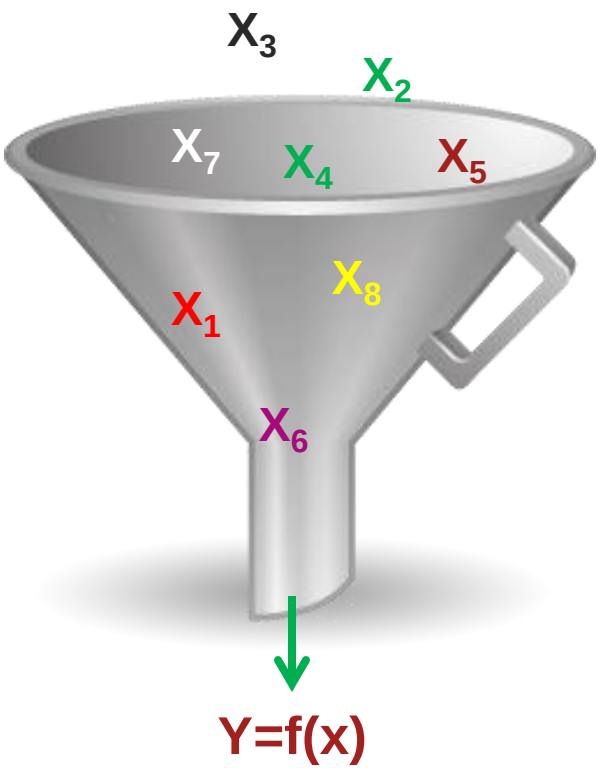
- Y refers to the measure or output of a process.
  - The “Y” is usually your primary metric
  - The “Y” is the measure of process performance that you're trying to improve.
- f(x) means “function of x”.
  - x’s are factors or inputs that affect the “Y”
- Combined, the Y=f(x) statement reads “Y is a function of x.”
- In simple terms: “My process performance is dependent on certain x’s”.
- The objective in a Six Sigma project is to identify the critical x’s that have the most influence on the output (Y) and adjust them so that the “Y” improves.

Six Sigma Approach: Y = f(x)

- Let's look at a simple example of a pizza delivery company that desires to meet customer expectations of on time delivery..
  - Measure = On time pizza deliveries
    - "Y" = percent of on time deliveries
  - "f(x)" would be the x's or factors that heavily influence timely deliveries
    - x1: might be traffic
    - x2: might be the # of delivery's per driver dispatch
    - x3: could be the accuracy of directions provided to the driver
    - x4: may be the reliability of the delivery vehicle
    - Etc.
- The statement Y=f(x) in this example will refer to the proven x's determined through the steps of a Six Sigma project.

Six Sigma Approach: Y = f(x)

- With this approach all potential x's are evaluated throughout the DMAIC methodology.
- Narrowing the x's down until the vital few x's that significantly influence "on time pizza deliveries" are identified!



Six Sigma Approach: Y = f(x)

- This approach to problem solving will take you through the process of determining all potential “x’s” that **might** influence on time deliveries and then determining through measurements & analysis which “x’s” **do** influence on time deliveries.
- Those significant x’s become the ones used in the Y=f(x) equation.
- The Y=f(x) equation is a very powerful concept and requires an ability to measure your output and quantify your inputs.
- Measuring process inputs and outputs is crucial to effectively determining the significant influences to any process.

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