Unit 6:
L-1
Six Sigma

Objectives

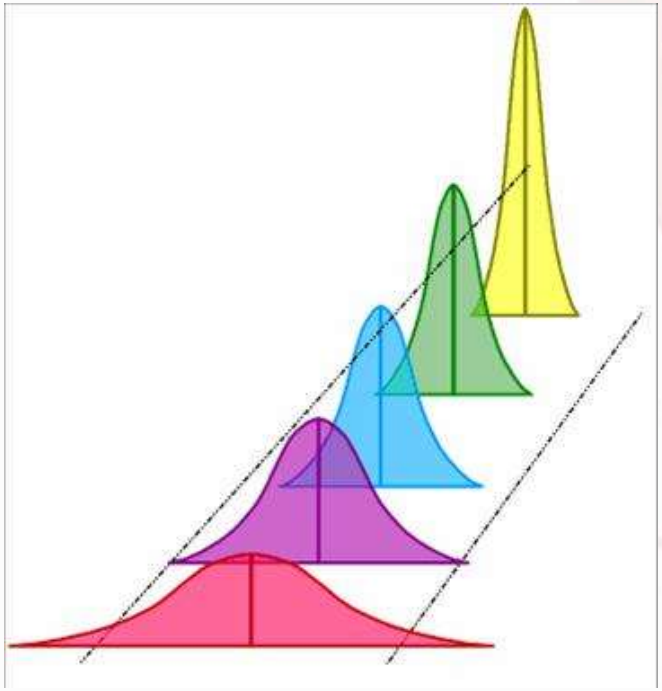
Sigma (σ) stands for the *standard deviation,* which is a measure of variation in the process. Assuming that the process output is represented by a normal distribution, about 99.73% of the output is contained within bounds that are three standard deviations (3σ) from the mean.

What is Six Sigma

- Business model developed by Motorola to eliminate production defects
- Exists from early 80's
- Implemented in many corporations today
- *Six Sigma at many organizations simply means a measure of quality that strives for near perfection*

Six Sigma in Mathematics

- Six sigma is a part of 68-95-99.7 rule
- This is method of probability determination



- 1 sigma = 31% efficiency
- 2 sigma = 69.2% efficiency
- 3 sigma = 93.32% efficiency
- 4 sigma = 99.379% efficiency
- 5 sigma = 99.977% efficiency

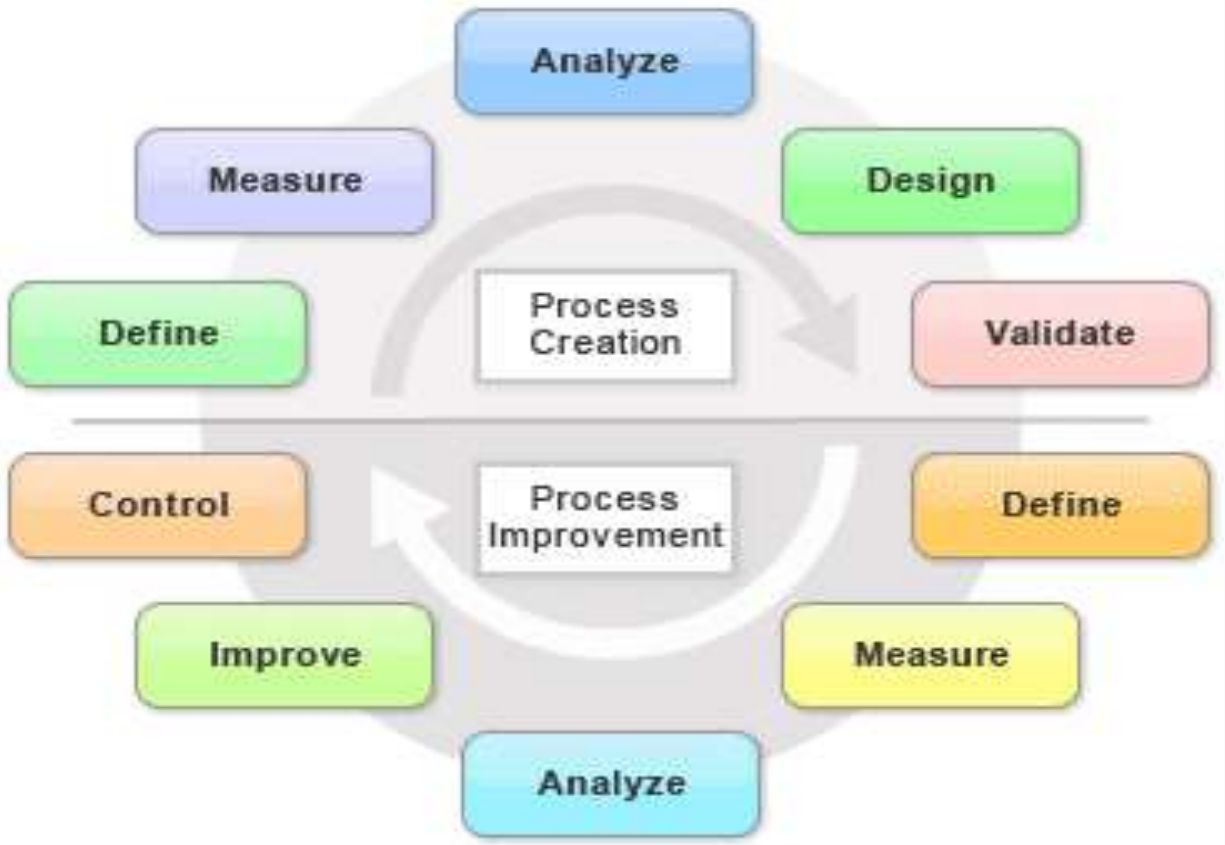
- 6 sigma = 99.9997% efficiency

What do we do

- Sigma six uses DMAIC method for improving production

1. ***D****efine* high-level project goals and the current process.
2. ***M****easure* key aspects of the current process and collect relevant data.
3. ***A****nalyze* the data to verify cause-and-effect relationships.
4. ***I****mprove* or optimize the process based upon data analysis using techniques like Design of experiments.
5. ***C****ontrol* to ensure that any deviations from target are corrected before they result in defects.

Six Sigma development process



DFSS-Design For Six Sigma

- Sigma six uses DMADV method for development of new products

- ***D****efine* design goals that are consistent with customer demands and the enterprise strategy.

- ***M****easure* and identify CTQs

- ***A****nalyze* to develop and design alternatives,

- ***D****esign* details, optimize the design,

- ***V****erify* the design, set up pilot runs, implement the production process

Implementation roles

1. *Executive Leadership* includes the CEO and other members of top management. They are responsible for setting up a vision for Six Sigma implementation.

2. *Champions* are responsible for Six Sigma implementation across the organization in an integrated manner.

3. *Master Black Belts*, identified by champions, act as in-house coaches on Six Sigma. They devote 100% of their time to Six Sigma.

4. *Black Belts* operate under Master Black Belts to apply Six Sigma methodology to specific projects. They devote 100% of their time to Six Sigma.

5. *Green Belts* are the employees who take up Six Sigma implementation along with their other job responsibilities.

Hierarchy

Six Sigma Change Agents

Why use Six Sigma?

- Unreliability can mean some very unhappy customers

- By improving production process
  we decrease production cost
  lost on defective products and
  guaranty our customers quality

Our profit is increased

Customers are more satisfied

Many companies today use Six Sigma

- Air Canada
- ALCAN
- Amazon.com
- Computer Sciences Corporation
- DHL
- Ford Motor Company
- General Electric
- Heinz Co.
- LG Group
- Microflex Inc.
- Motorola
- Samsung Group
- Siemens AG
- United States Army
- Vodafone
- Whirlpool
- Xerox

There are many tools for Six Sigma

- iGrafx Process for Six Sigma EngineRoom by MoreSteam
- IBM WebSphere Business Modeler
- JMP
- Microsoft Visio
- Minitab
- Quality Companion by Minitab
- SigmaXL
- Software AG webMethods BPM Suite
- Statgraphics
- STATISTICA
- Telelogic System Architect
- Actuate
- The Unscrambler
- Select Architect Business Process Modeling

Conclusion

1. It’s more product oriented than any other model of development

2. Six Sigma is a great way to improve your production in any area of business

3. It’s techniques reduce errors which cost more in production than in design

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