SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

19AUZ405 – LEAN MANUFACTURING

IV YEAR / VII SEMESTER

Topic – Six Sigma Statistical Consideration

Six Sigma Objectives

✓ **Overall Business Improvement**

Six Sigma methodology focuses on business improvement. Beyond reducing the number of defects present in any given number of products.

✓ **Remedy Defects/Variability**

Any business seeking improved numbers must reduce the number of defective products or services it produces. Defective products can harm customer satisfaction levels.

✓ <u>Reduce Costs</u>

Reduced costs equal increased profits. A company implementing Six Sigma principles has to look to reduce costs wherever it possibly can--without reducing quality.

✓ <u>Improve Cycle Time</u>

Any reduction in the amount of time it takes to produce a product or perform a service means money saved, both in maintenance costs and personnel wages. Additionally, customer satisfaction improves when both retailers and end users receive products sooner than expected. The company that can get a product to its customer faster may win her business.

✓**Increase Customer Satisfaction**

Customer satisfaction depends upon successful resolution of all Six Sigma's other objectives. But customer satisfaction is an objective all its own.
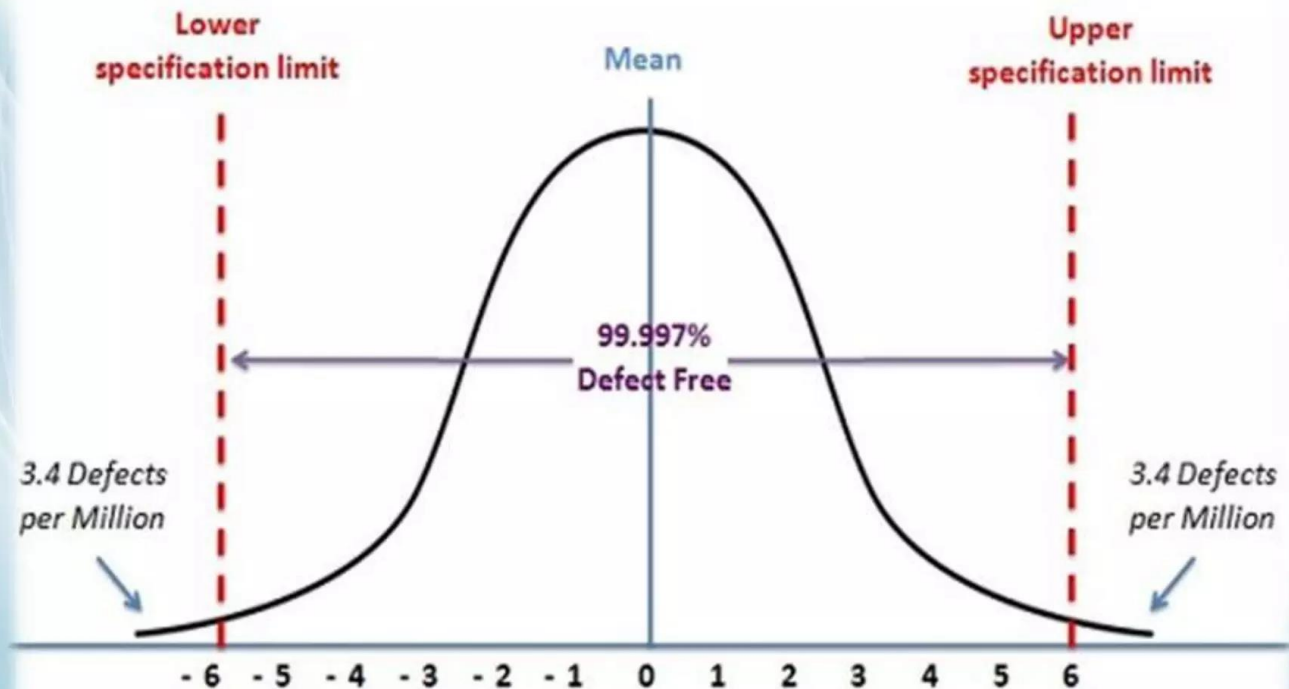
Levels of Six Sigma

	Six Sigma Level	% Accuracy	DPMO
Virtual Perfection	6	99.9997%	3.4
	5	99.98%	233
	4	99.4%	6210
Good	3.5	97.7%	22,700
	3	93.3%	66,807
Improvement Needed	2	69.1%	308,537

1. DMAIC

DMAIC is used for projects aimed at improving an existing business process.

2. DMADV

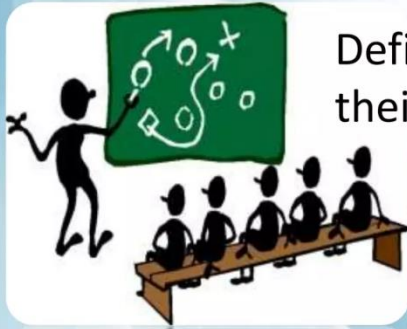DMADV is used for projects aimed at creating new product or process designs.

1.Define

Define the system, the voice of the customer and their requirements, and the project goals, specifically.

2.Measure

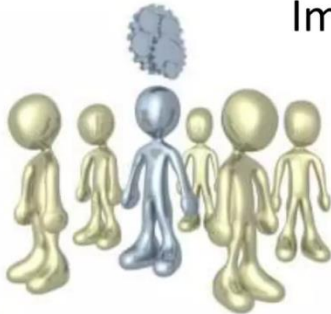Measure key aspects of the current process and collect relevant data.

3.Analyze

Analyze the data to investigate and verify cause-and effect relationships. Determine what the relationships are, and attempt to ensure that all factors have been considered. Seek out root cause of the defect under investigation.

4.Improve

Improve or optimize the current process based upon data analysis using techniques such as design of experiments, poka yoke or mistake *proofing,* and standard work to create a new, future state process. Set up pilot runs to establish process capability.

5.Control

Control the future state process to ensure that any deviations from target are corrected before they result in defects. Implement control systems such as statistical process control, production boards, visual workplaces, and continuously monitor the process.

2. DMADV

DMADV project methodology has Five phase:

1. *Define*

    ↓

2. Measure

    ↓

3. Analyze

    ↓

4. Design

    ↓

5. Verify

1.Define :

Define design goals that are consistent with customer demands and the enterprise strategy.

2.Measure

Measure and identify CTQs (characteristics that are Critical To Quality), product capabilities, production process capability, and risks.

3. <u>Analyze</u>

Analyze to develop and design alternatives.

4. <u>Design</u>

Design an improved alternative, best suited per analysis in the previous step

5. <u>Verify</u>

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

Software used for Six Sigma

- Arena
- ARIS Six Sigma
- Bonita Open Solution BPMN2 standard and KPIs for statistic monitoring
- JMP
- Mathematical
- MATLAB or GNU Octave
- Microsoft Visio
- STATA
- STATISTICA

And Many more.....

Thank You !