

B.Kiran Kumar Reddy
Assistant Professor
Malla Reddy Engineering
College(Autonomous)
Department of Master Of Business Administration
9052222478
Kiran.busi@gmail.com

Six Sigma in Indian industries Surya Report

Abstract

Six Sigma is a statistical concept that measures a process in terms of defects. Achieving "Six Sigma" means your processes are delivering only 3.4 defects per million opportunities (DPMO) - in other words, they are working nearly perfectly. Sigma (the Greek letter σ) is a term in statistics that measures standard deviation. In its business use, it indicates defects in the outputs of a process, and helps us to understand how far the process deviates from perfection. A sigma represents 691462.5 defects per million opportunities, which translates to only 30.854% of non-defective outputs. That is obviously a poor performing process. If you have a process functioning at a three sigma level that means you're allowing 66807.2 errors per million opportunities, or delivering 93.319% non-defective outputs. That's much better, but we are still wasting money and disappointing our customers.

Introduction

The central idea of Six Sigma management is that if you can measure the defects in a process, you can systematically figure out ways to

eliminate them to approach a quality level of zero defects.

In short, Six Sigma is several things:

- ❖ A statistical basis of measurement: 3.4 defects per million opportunities
- ❖ A philosophy and a goal: as perfect as practically possible
- ❖ A methodology
- ❖ A symbol of quality

Benefits and Advantages of Six Sigma

Improved Customer Loyalty

Customer Satisfaction

Business Results

Every organization wants to achieve some level of results. Unfortunately too often not everyone in the organization has the same results in mind. Having agreement on the desired results tends to focus efforts. Even if they do agree upon the basic description of the results how to measure achievement of those results is in disagreement. Understand what the desired results are.

Some common result areas:

- Sales volume
- Profit before tax
- Market share
- Earnings per share
- Repeat business %
- New customers %
- Cash Flow

- Cycle Time
- Patents issued
- Safety performance
- Returns
- Warranty claims
- Environmental performance
- Defect level
- Scrap
- First pass prime
- Cost per unit produced
- Debt to equity
- Many others

Agree on how to measure the result area. Is the measurement system capable of producing numbers that are useful for the intended result area? Do all of the affected people have confidence in the measurement system? Can numbers be generated quickly enough to be useful? Does the measurement depend upon the level of the result? Generally measurements over a continuum (e.g. % completion) are more useful than yes/no (e.g. done/not done) type measurement.

Key Concepts of Six Sigma

At its core, Six Sigma revolves around a few key concepts.

Critical to Quality: Attributes most important to the customer

Defect: Failing to deliver what the customer wants

Process Capability: What your process can deliver

Variation: What the customer sees and feels

Stable Operations: Ensuring consistent, predictable processes to improve what the customer sees and feels

Design for Six Sigma: Designing to meet customer needs and process capability

Six Sigma focuses first on reducing process variation and then on improving the process capability. Customers value consistent, predictable business processes that deliver world-class levels of quality. This is what Six Sigma strives to produce.

DFSS - (Design for Six Sigma) is a systematic methodology utilizing tools, training and measurements to enable us to design products and processes that meet customer expectations and can be produced at Six Sigma quality levels.

DMAIC - (Define, Measure, Analyze, Improve and Control) is a process for continued improvement. It is systematic, scientific and fact based. This closed-loop

process eliminates unproductive steps, often focuses on new measurements, and applies technology for improvement.

Six Sigma - A vision of quality which equates with only 3.4 defects per million opportunities for each product or service transaction. Strives for perfection.

Six Sigma Quality Tools and Templates

- ❖ Affinity Diagram
- ❖ Brainstorming
- ❖ Calculators
- ❖ Cause & Effect / Ishikawa / Fishbone
- ❖ Charters
- ❖ Control Charts
- ❖ Contract Management Software
- ❖ Creativity / Out of the Box Thinking
- ❖ Design Of Experiment
- ❖ Document Control
- ❖ Flow Chart / Flow Charting
- ❖ FMEA / Risk Assessment
- ❖ Glossaries
- ❖ Histogram
- ❖ Kano Analysis
- ❖ Organizing Data
- ❖ Online Statistics Textbooks
- ❖ Pareto
- ❖ Poka Yoke (Mistake Proofing)

- ❖ Process Map / Process Mapping
- ❖ Project Charters
- ❖ Quality Function Deployment / House of Quality
- ❖ Scatter Diagram / Plot
- ❖ SIPOC Diagram
- ❖ Software
- ❖ Support and Restraint
- ❖ Surveys (@)
- ❖ Thinking Out Of The Box
- ❖ Few of the above is as follows

Large organizations that have adopted six sigma

These are some the large Indian and International organizations that have used Six Sigma. There are thousands more all over the world.

3M	Camp	Kraft	Seagat
AB	bell	Gener	e
Dick	Soup	al	Sony
Adolp	Chevr	Foods	Star
h	on	Lear	Qualit
Coors	Citico	Astro	y
Adva	rp	nic	Texaco
nced	Cloro	Lockh	Texas
Micro	x	eed	Instru
Devic	Dano	marti	ments

es	n	n	TRW
Allied	Dow	McDo	US
Signal	Fideli	nnell	Army
Alcoa	ty	Dougl	US Air
Aerop	Intel	as	Force
space	Ford	Micro	United
Corp	Gener	soft	Techno
Abbot	al	Motor	logies
ts	Dyna	ola	UPS
Labs	mics	NAS	Xerox
Apple	GE	A	Airtel
Comp	HP	North	Bharti
uter	Hone	rop	TATA
Bank	ywell	Corp	Relian
of	Kaiser	Penta	ce
USA	Alumi	gon	TCS
Beatri	nium	Parkv	
ce	Infosy	iew	
Foods	s	Hospi	
Bell		tal	
Helic		Rock	
opter		well	
Boein		Int	
g		Rohm	
Bristo		and	
l		Haas	
Myers		ICICI	
Squib		HDF	
b		C	

City of Dallas		Wipro	
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The executive committee continuously monitors the projects. There are monthly reviews carried out by the Champion, Sponsor and IGE. A quality dashboard has also been created, wherein every month performance is reported. The CEO and the COO monitor whether the objectives are being met.

Benefits

In six months BBNL had achieved timely complaint resolution 66 percent from the baseline, timely order implementation up 70 percent from baseline, timely invoice submission up 51 percent from baseline and NOC complaint resolution that was 49 percent from baseline. The Six Sigma process improvements have translated into productivity enhancements, improved customer satisfaction and process effectiveness. BBNL is targeting

an estimated saving of around Rs 10 crore in the first year of operation.

The target was to achieve 99 percent (i.e. approximately four Sigma level) ('First Time Right') with respect to respective set norms by March 2004 on all key critical processes. Since Six Sigma is a continuous improvement initiative, the company will be undertaking another business objective for the next financial year. On the future roadmap are Six Sigma for all processes and higher E-SAT (employee satisfaction) and C-SAT (customer satisfaction) index. BBNL plans to get almost 90 percent of the employees to be Green Belts by 2005, with almost 100 percent of the employees to be involved in the Six Sigma journey by the same time.

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