



Lynx Systems

Six Sigma for Business Success

Implementing Six Sigma In A Non-Manufacturing Organization

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Some historical notes in Six Sigma

- Quality Technologies evolved from manufacturing. SPC, PDCA all started from W.A. Shewhart in his book
 - Economic Control of Quality of Manufactured Product (1931);
- W.Edwards Deming looked at quality as a systemic issues and emphasizes the transformation of the management, continuous process improvement and use of statistics.
 - Out of the Crisis (1982)
 - Quality, Productivity and Competitive Position (1982)
- Motorola (1987) started to use six sigma as the end and the mean to achieve high quality products in its manufacturing and suppliers.
- GE (1995) adopted the method to manage the enterprise. Which linked the six sigma projects to achieve the company strategic goals.
 - The Six Sigma Revolution; by G. Eckes (2001)



Characteristics of applying Six Sigma to non-manufacturing Organization

- **Focus on the customer need.**
 - Understand and identify customer's needs and requirements and to satisfy it, is the top priority
- **Data and Fact Driven management**
 - Performance measurements is the key for the improvement of the process
- **Process Focus management and Improvement**
 - Versus products focus. To improve a product or service performance requires the understanding of how to manage and improve the process which produces the service or the products.
- **Proactive management**
 - Versus reactive. Planning to achieve six sigma is the norm.
- **Collaboration without Boundary**
 - Problems or improvement opportunities not existed to the artifact of the organizational boundary.
- **Drive toward Six Sigma**
 - This is the core of the continues improvement



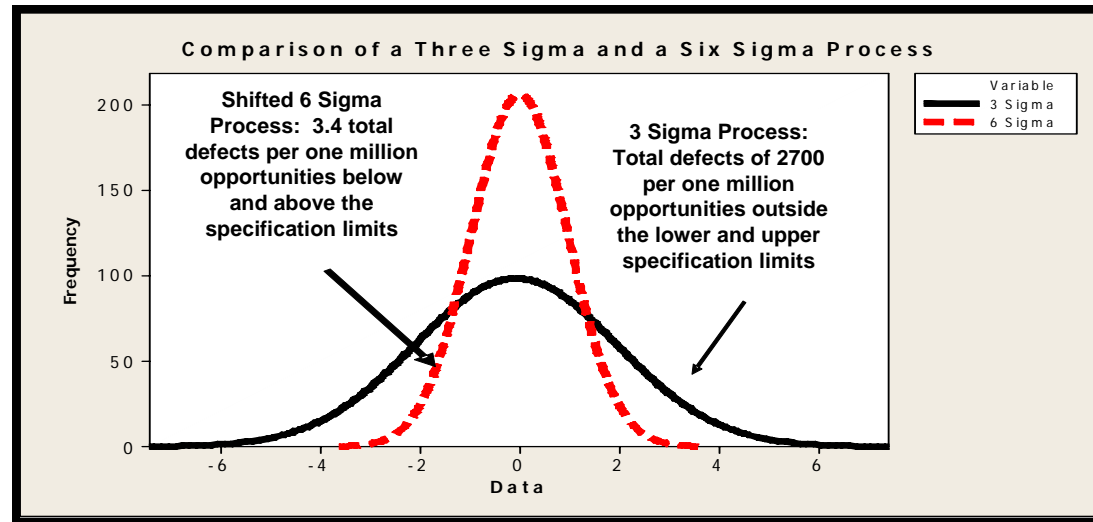
Sigma

Sigma Refers to Standard Deviation:

- Is a measure of the variability of a population
- Indicator of capability of process to perform error free work
- As Sigma improves, costs go down, cycle time goes down and customer satisfaction increases



Defining Six Sigma



Sigma Measures:

One Sigma	68.27%	317,300 DPM
Two Sigma	95.45%	45,500 DPM
Three Sigma	99.73%	2,700 DPM
Four & half Sigma	99.99966%	6.8 DPM

The statistical interpretation is — decrease your process variation in order to improve your process sigma. The end result is greater customer satisfaction, and lower costs.

Defining Six Sigma

Sigma	CumProbability	Cpk	PPB Failing One Sided	PPB Failing Two Sided	PPM One Sided	PPM Two Sided
0.5	0.6914624603416570	0.17	308537539.66	617075079.32	308537.5	617075.1
1.0	0.8413447393693560	0.33	158655260.63	317310521.26	158655.1	317310.5
1.5	0.9331927987330160	0.50	66807201.27	133614402.53	66807.2	133614.4
2.0	0.9772498680509740	0.67	22750131.95	45500263.90	22750.1	45500.3
2.5	0.9937903346744610	0.83	6209665.33	12419330.65	6209.7	12419.3
3.0	0.9986501019683740	1.00	1349898.03	2699796.06	1349.9	2699.8
3.5	0.9997673709209560	1.17	232629.08	465258.16	232.6	465.3
4.0	0.9999683287581660	1.33	31671.24	63342.48	31.7	63.3
4.5	0.9999966023268750	1.50	3397.67	6795.35	3.34	6.8
5.0	0.9999997133484280	1.67	286.65	573.30	0.2867	0.5733
5.5	0.9999999810104380	1.83	18.99	37.98	0.0190	0.0380
6.0	0.9999999990134120	2.00	0.99	1.97	0.0010	0.0020



MTBF vs Process Sigma

Sigma	3	4	5	6
Monthly Production	Months to Failure (MTBF)			
1,000	0.333333	15.798	1754.4	507614
10,000	0.037037	1.5788	174.52	50684
100,000	0.003704	0.1579	17.44	5068.2
1,000,000	0.00037	0.0158	1.74	506.8
10,000,000	0.000037	0.0016	0.17	52.27
100,000,000	0.000004	0.0002	0.02	5.23



Six Sigma Business Strategy

1. Creation of strategic business objectives based on VOC.
2. Identify key, sub- and enabling process which linked to the achievement of the objectives
3. Select and define projects to tackle the improvement or optimization of the process.
4. Creation and validation of the key performance metrics (a measurement of effectiveness and efficiency) for each process.
5. Collecting data on the key measurements of the process. And understand the characteristics of the process.
6. Improve or optimize the process based on the characterized process
7. Monitor and control of the improved or optimized process to the achievement of the strategic goals.

Example of metrics used in various non manufacturing organizations

Industry	Metrics	Impact to Business
Insurance	Cycle time New Product risk Document errors	Loss of opportunity Product strategy Rework and liability
Healthcare	Registration waiting time Document errors Wrong diagnosis Medicine dispatch errors Operation errors	Loss of revenue Rework and liability Liability and quality of services Liability and quality of services Liability and reputation
Bank	Transaction errors Process cycle time Number of verifications	Revenue loss Customer satisfaction None value added

Example of metrics used in various non manufacturing organizations (continued)

Industry	Metrics	Impact to Business
Hotel	% booking Number of return customers Quality of Services	Increase revenue Increase revenue Customer complaints
Finance	Account Receivable Capital Available Profit after tax Data accuracy	Working capital Working capital Growth of the company Accurate financial analysis
Construction	Delay in completion Construction error and accident Cost overrun	Cost and reputation Cost and time to complete Profit

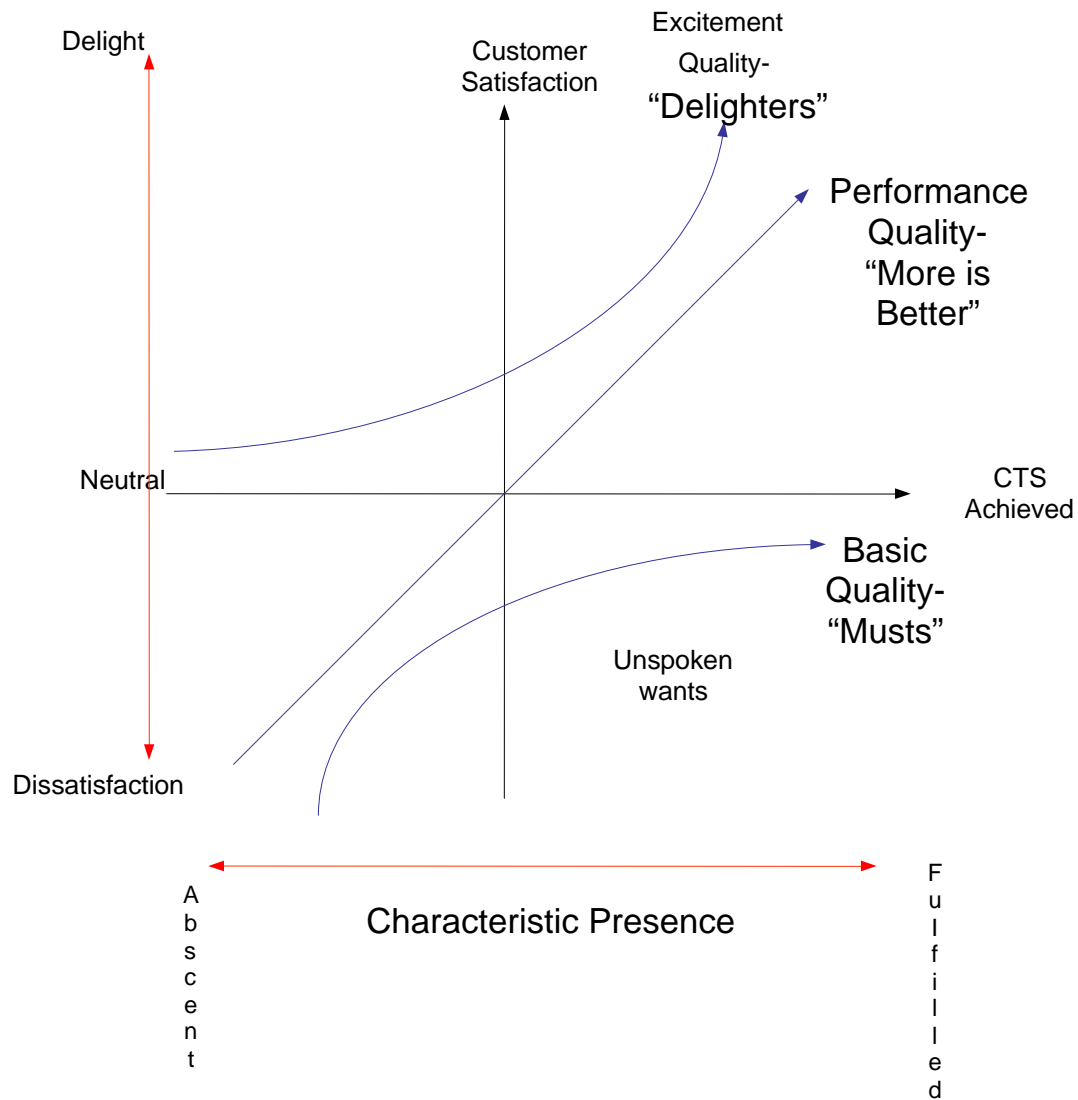


Kano Analysis

- Customer Requirement Analytical Method
- Developed by Dr. Noriako Kano
- Structures Customer Requirements
- Relates Customer Satisfaction to Requirements

Kano Analysis

Kano's Model of Spoken and Unspoken Quality





Kano Analysis

- Basic Customer Needs:
 - Expected by Customers
 - Absence Creates Dissatisfaction
 - Neutral to Customer if Present
- Performance Attributes:
 - Directly Related to Customer Satisfaction
 - Commonly Used for Competitive Advantage
- Delighters/Exciters:
 - Upper Curve of Model
 - Unexpected
 - Highest Impact to Satisfaction



Example – Implementing Six Sigma in a sale organization

Challenges in implementing six sigma in a sale organization

1. Managing sales as a process
2. Measuring the sales process
3. Committing Resources to six sigma projects
4. Translating the six sigma training to the one which are perceived by the sales people as relevant.



*Example –
Implementing Six Sigma in a sale
organization*

**Identify potential Benefit of implementing
six sigma in the sales organization**

1. Increase win rates in the competitive bid.
2. Improved customer penetration and retention.
3. Increase sales productivity



Example – Implementing Six Sigma in a sale organization

Sales/Marketing Processes

- Client relationship management
- Sales effectiveness
- New market development
- Pricing process improvement
- Advertising/communication improvement
- Branding effectiveness
- Channel effectiveness
- Lead management
- Service improvement
- Product development



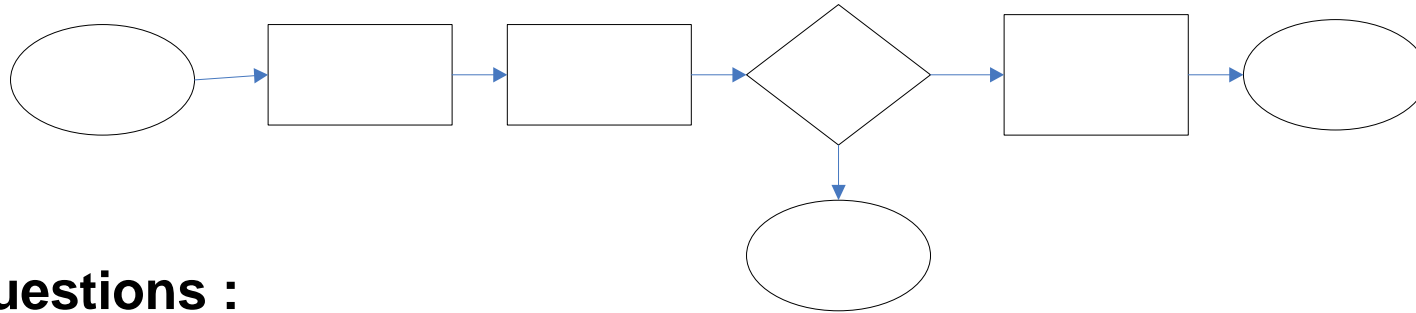
Example – Implementing Six Sigma in a sale organization

- How can we give our sales people more selling time? (3M)
- How can we, "increase product leads from the company's Web site without increasing media spend." (xerox)
- Does wining and dining prospective customers lead to sales?
- How to reduce the sales representatives administrative tasks by 50% and to optimize the Order & Revenue Management Process for its customers. (Cordis)
- Sales forecasts 25% below plan, our sales effectiveness and efficiency is hampered by sales engagement practices variation and by management inconsistencies (Sun)
- How to improve the closure rates from the leads derived from the web? (a case study)



Case Study – How to improve the closure rates from the leads derived from the web?

**Define : A lead management process flow-
What do we need more?**



Questions :

- How long it takes from the customer entered the lead information to a sales person call ?
- Who is the owner of this lead management process?
- What information are used to qualify (or quantify) the sale probability and size of the potential sale?



Case Study – How to improve the closure rates from the leads derived from the web?

Measure : A measurement of status quo and serves a set of metrics to measure the improvements. Usually, metrics measure CTS.

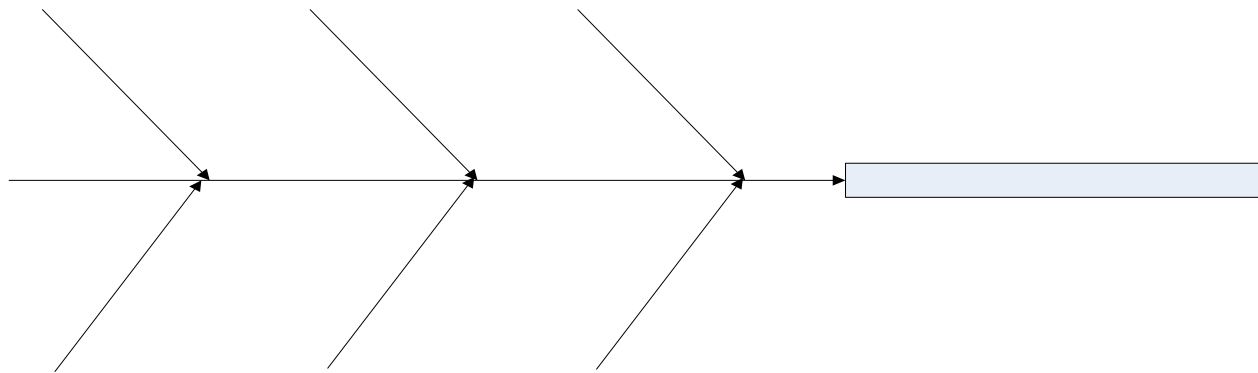
Metrics :

- Response time
- Lead Conversion rate
- Lead to close ratio
- Average Sale per lead
- Average close time



Case Study – How to improve the closure rates from the leads derived from the web?

Analyze : To use the metrics and the six sigma tools such as, process mapping, fish bone diagram, FMEA... to understand the nature of the process and characterize the process



Case Study – How to improve the closure rates from the leads derived from the web?

Improve : Based on the analyzed result to find an improvement and to optimize the process

Implementing a new and revised process :

- Clearly defined lead management process, a new process map.
- Clearly defined process owners
- Publish lead management metrics
- Establish a six sigma standard
- Continuously to find improvement to the process



Case Study – How to improve the closure rates from the leads derived from the web?

Control : The control will be based on the metrics developed for the process to feedback on the system performance and provide an advanced warning for any deterioration, or serve as a baseline for future improvements.

Control the Improved/optimized process :

- Clearly defined lead management control process
- SPC on the critical metrics



Summary

The lead management is just a component of bigger process of sales and marketing. A higher level process can be approached in the same way such as :

- Lead Generation
- Sales
- Fulfillment
- Customer Support



Summary

- Six sigma provides a structured and proven methodologies to improve the effectiveness and efficiency of the operation of an organization
- Six Sigma requires a holistic approach to the implementation that is, it requires process, methods and infrastructure.
- Understand Voice of customers and translates VOC to the business strategic objectives.
- Identify projects which will drive to achieve the business objectives.
- Using six sigma approach as a normal way of conducting business
- People are trained to conduct six sigma projects.
- Build a culture of making decision based on the data and facts
- Continuous drive to achieve six sigma