

Six Sigma Quality - Linking Customers, Processes and Financial Results

by Sunil Thawani

Mr. Jack Welch, ex Chairman of General Electric (GE), in his recent book “Straight from the gut” writes that when he learnt that GE was running at 3 to 4 sigma level and the cost saving opportunity of raising this quality to six sigma level was somewhere between US \$ 7 to 10 billion, he saw a huge opportunity and decided to go for six sigma. He asked his CEOs to take off their bright and best (only the best) people from their existing jobs to train them in Six Sigma methodology.

Since 1996, GE has trained thousands of its employees as Green Belts & Black belts to take up improvement projects and achieved huge productivity gains and improvements - US \$ 320 million in 1997, \$ 750 million in 1998 and \$ 1.5 billion in 1999.

What is Six Sigma ?

Sigma is a Greek alphabet and is used in statistics as a measure to denote the standard variation in a process. More specifically sigma measures the capability of the process to perform defect free work. A defect is anything that results in customer dissatisfaction. With Six sigma the common measurement index is “defects per unit” where a unit can be virtually anything for instance, a component part, piece of material, cycle time frame etc.

The sigma value indicates how often defects are likely to occur. As sigma increases, cost and cycle time go down while profitability, productivity and customer satisfaction go up.

Many manufacturing company processes operate at 3 sigma level which translates into approx. 67000 defects per million, while service company processes are often at 1 to 2 sigma level i.e. 690,000 to 308,000 defects per million.

As per Six sigma forum, operating at 99 % defect free level means:

- Atleast 200,000 wrong drug prescriptions each year
- Two short or long landings at major airports each day
- 5000 incorrect surgical procedures per week
- Unsafe drinking water for almost 15 minutes each day
- No electricity for almost 7 hours each month
- 50 dropped newborn babies each day

Is 99 % quality good enough ?

Six Sigma's target is to achieve less than 3.4 defects or errors per million opportunities and hence the name. So, higher the number of sigmas, more consistent is the process output or smaller the variation. Six Sigma was "born" in Motorola about 15 years back.

Six sigma is a high performance, data driven approach for analyzing the root causes of business processes/ problems and solving them.

The real challenge with six sigma is not the statistics. It is getting to the point where one can meaningfully measure a business's current performance against dynamic customer requirements while developing the internal abilities to respond to changing market place conditions.

All kinds of businesses are joining the six sigma band wagon – manufacturing, health care, finance, engineering, marketing are using to achieve major improvements in manufacturing, inventory, delivery, etc.

Though Six Sigma methodology uses many statistical tools, but it would not be correct say that Six sigma is only Engineers or statisticians or technical minds.

It is not required to achieve six sigma level of performance for all the processes. What really matters is to achieve significant improvements in critical areas – as defined by customer e.g. the date customer actually wants a product to be delivered and not the "negotiated or promised" date of delivery.

Six sigma links Customers, Process improvements and financial results.

Understanding Variation:

Let me again take the help of an example cited by Mr. Jack Welch in understanding variation.

GE was 3 years into implementing Six Sigma and lot of improvements in cycle time, quality, efficiency of processes and their effectiveness, reduction in waste, cost of poor quality etc. were being reported and celebrated throughout the company. Results were impressive but GE customers were not feeling the difference in quality.

The problem was GE was measuring improvement based on averages and without regard to customer. E.g. if the product delivery time was reduced from an average of 16 days to 8 days, a 50 % improvement was reported. 8 days average meant that some customers received their products early - in 4 days and some late - in 12 days. The customer continued to feel unpredictability and variance.

When the application of variation was felt by GE, it got away from Averages to Variation by tightening the “ Span “. The span measured the variation – from the exact date the customer wanted the product till product was actually delivered – days early, days late or on time. Getting span to zero meant the customer always got the products when they asked for it. So GE was 3 years into six sigma before they “ Got it”.

Six Sigma Methodology

Unlike many methodologies, Six Sigma uses a structured problem solving methods linking customer requirements with processes and tangible results. It selects the appropriate tools from a wide variety.

Over the last 10-15 years, various six sigma methodologies have been developed and used by organisations. One of the most common one is – Define, Measure, Analyze, Improve, Control and is briefly described below:

Define – Identify, evaluate and select projects for improvement and select teams.

Measure – Collect data on size of the selected problem, identify key customer requirements, determine key product and process characteristics.

Analyze – Analyze data, establish and confirm the “ vital few “ determinants of the performance.

Improve – Design and carry out experiments to establish cause & effect relationships and optimize the process.

Control – Design the controls, make improvements, implement and monitor.

It is commonly reported that each six sigma project produces savings to the tune of US \$ 100000 to 250000.

The Players:

Most of the Six Sigma projects are process centered and require cross functional teams. Effective team working is critical to the success of six sigma projects. To provide effective leadership to teams and their effective operation, the roles and responsibilities of various Players is well defined. Commonly used terminologies are Project Champions and Black Belts. Their roles in brief are given below:

Project Champions are involved in selecting projects and identifying Black and Green Belt candidates. They set improvement targets, provide resources, review the projects on regular basis and remove any road blocks to programs success.

Master Black Belts are the technical leaders of Six Sigma. They serve as instructors for both -Black & Green Belts and provide ongoing coaching and support to project teams to assure the appropriate application of statistics. They provide strategic and operational assistance to project Champions and management in the formation and deployment of the Six Sigma program.

Black Belts are the backbone of Six Sigma deployment and continuous improvements. They build teams and attack problems by managing projects and then driving the teams for solutions that work, resulting in delivery of bottom line results.

Green Belts provide internal team support to Black Belts. They assist in data collection, computer data input analysis of data using the software and preparation of reports for management.

How long will the Six Sigma flavour last ?

To reduce costs, waste, variation, cycle time and increase levels of quality and customer satisfactions, Organisations are under continuing pressures to use breakthrough philosophies and methodologies like Business Process Reengineering, Enterprise Resource Planning, Six Sigma to address such chronic issues.

Since Six Sigma methodology has been able to link customer, processes and financial benefits and has demonstrated significant results, it has generated incredible amount of interest in US & Europe and caught the imagination of corporations like General Electric, Sony, Toshiba, JP Morgan, American Express, Samsung, Wipro, Honeywell (Allied Signal), 3 M, Bombardier etc. Incidentally UAE is also not far behind.

Concept of Six Sigma has been around for over 15 years now. Quoting, Mr. A. Blanton Godfrey, founding Editor of Six Sigma Forum magazine, if it is a fad, it is a long lasting one.

As long as organisations find Six Sigma effective in reducing cost and/ or improve quality and customer satisfaction, it would be around, may be, with a different name as we seem to love new names for similar things.

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