

So what exactly is..

Six Sigma?

It hasn't yet hit many British businesses, but in the USA Six Sigma is heralded as the next step to quality improvement and business excellence. Stephen Halliday explains

What's it about, then?

Six Sigma is about understanding variation within products or processes. Reducing this variation produces more consistent product functionality or process output - leading to better processes, more reliable products, lower costs and ultimately happier customers.

Where does it come from?

In 1985, Bill Smith of Motorola presented a paper showing that products assembled error free rarely failed during early use by the customer. Another Motorola employee, Mikel Harry, modified the principles and set up his own consultancy (Six Sigma Academy). In the mid-1990s, Jack Welch proclaimed that GE was making great savings with Six Sigma; other major American firms then became Six Sigma devotees.

What is Sigma, and why six?

'Sigma' describes the spread of the output from a process. As sigma increases, this spread reduces, product reliability goes up, the need for testing and inspection diminishes, work in progress, costs and cycle time fall and customer satisfaction rises.

Consider a car that just fits into a garage: one small shift to either side will damage the car. This depicts the situation



where a process's output can just meet the required specification-this would be three sigmas. The aim of Six Sigma is to reduce the width of the car such that two cars would fit into the garage - representing six sigmas. In process terms, this would reduce the number of defects to 3.4 per million.

So how does Six Sigma work?

The generic process is as follows:

- Define the goals of the existing system - choose a process or product critical to business success.
- * Measure the current system - select a characteristic critical to quality, and map and measure the process.
- Analyse the system - benchmark to identify potential areas for improvement, using simple quality tools and basic statistics.
- improve the system - determine how to change the process significantly and cut defect levels, maybe using more advanced tools such as experimental design.
- * Control the new system - standardise and monitor the new process to ensure the gains are realised. This may involve using statistical process control (SPC).

Lots of statistics, then?

Typical Six Sigma training programmes rely strongly on statistical methods. These are taught to proposed project leaders (Black Belts) usually in four one-week sessions over four months, complemented by a project applying the techniques. Green Belts (project team members) receive two one-week training sessions. Some US courses can run to \$20,000 or more per Black Belt.

Is training the same everywhere?

Unfortunately there is no Six Sigma standard, each provider offers a different view and curriculum. Some say successfully completing two projects qualifies you as a Black Belt; some say three; others give accreditation to those who have simply completed the training course. Motorola itself has additional Yellow Belts and one consultancy has the position of Brown Belt. One company has created Lean Sigma from Six Sigma and Lean Manufacturing!

Is any of this really new ?

Those who have lived through quality initiatives during the last 20 years will

recognise many of the concepts. There is little new about Six Sigma, except it brings together many successful techniques.

What's the secret of its success?

Six Sigma advocates would probably say that it is the correct application of the steps and tools. Interestingly, previous initiatives that had faded out at GE and elsewhere had used similar tools to Six Sigma.

Six Sigma is driven from the highest level of the organisation. In most cases, Black Belts are released from their day-to-day work to work full-time on projects.

In GE, 40 per cent of executives' incentives are tied to key Six Sigma achievements. In Motorola, Black Belts receive bonuses for project success.

Like any successful initiative, Six Sigma requires top management commitment, provision of appropriate resources and training; however, many question the need for four weeks' statistical methodology.

Is there a less complex alternative?

One simple way to start is to get a group of those involved with a process to define it in a flowchart. This reveals differences in understanding of the process and can highlight possible changes.

Six Sigma focuses on measurement, but once the measures have been decided, advanced statistical methods are not needed. The well-used seven simple quality tools, including histograms and run charts, in conjunction with basic statistical process control and simple statistical methods, will suffice for many situations.

Overloading individuals with statistical methodology will not necessarily produce success. What is needed is a knowledge of practical, straightforward methodologies that everyone can put into practice - problem solving, process mapping, seven simple tools, SPC and teamworking.

Did you say teamworking?

Yes-knowledge of teamworking and facilitation is also essential, and basic project management skills may need to be added. More advanced tools can be picked up as and when needed.

If you need help, find a company that has had success in the application of statistical methods, not one that simply delivers a training course. •

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