## The great Indian quandary

# Lean or Six Sigma?

The question at the top of the minds of many CEOs and their senior managers is "which is the best strategy for us - Lean Manufacturing, Six Sigma, TQM, discrete manufacturing etc". "Are these different approaches? Do we have to decide on one and leave the others? Does it work for batch production factories? Does it work for machine tool industry?"... How do you know which one is best for you? Read on about this great Indian quandary to find the answer...

Sanjeev Baitmangalkar

By the 1980s the Japanese were gaining market share and customers in the western world. Leading them in the field of manufacturing was perhaps a company called Toyota. Toyota had proved that its production system was something to recognise and for the world to emulate. It was then that Motorola announced its Six Sigma strategy, followed by GE. Two decades have gone by since, and the results achieved by those who practise either of these strategies talk for themselves. Was it the inability of the Americans to accept the Japanese production system as one that adds better value that mandated the American industry to jargon an alternative?


Did Six Sigma come out of the American inability to socially and culturally adapt to the Japanese way of thinking? After all had they not held on to Henry Fords production methods and somewhat improvised too? Weren't they who pioneered the complex MRP system? Hadn't the world looked up to them and tried to emulate them since the First World War? Defeat is always hard to swallow. Indians read English. Japanese mostly write Japanese. Americans write American English. The bookstores are full of titles on Six Sigma, Lean Six Sigma, etc. You see more books on Six Sigma than on Lean Manufacturing. Perhaps there are more consultants talking Six Sigma than Lean. And this adds to the confusion.

Doubt is man's greatest enemy. What is Six Sigma? What is Lean Six Sigma? What really is Lean then? Which is a better strategy for your company? Do you really have that choice?

Is there a choice at all? Let's explore the two philosophies and see how they differentiate. Perhaps this understanding will help you to decide which one is best for your organisation.

Six Sigma is an approach to quality improvement and is focussed on process capability. Lean Manufacturing is a system that encompasses the entire value stream – the customer, production, quality, supply chain, human resource, engineering, and maintenance and other support aspects.

Six Sigma focusses on reduction of variation in an organisation. It claims this reduction will solve process and business problems. Statistical methods are used here to predict the expected outcome of a work process. If the outcome is not satisfactory, it encourages making adjustments in the process. Lean focusses on removal of waste. Waste is defined as anything not necessary to produce a product or service. Lean focusses on developing the workflow. Lean thinking is a set of concepts and methods aimed at simplifying the way an organisation produces value for its customers while eliminating all waste.

There are five principles in the journey to improvement and creating a Lean Enterprise:

***Define the value from the point of customer:*** Define what the customer wants. All characteristics of the product or service must align with the customers' perception of value. Go beyond the QCD paradigm. Develop a psychological attribute, which in the perception of your customer will list your product superior to your competitor – safety, engineering, reliability, styling, presence, experience and feel, etc. ( Ref: 'It's all about differentiating ideas' Part I & II in Modern Machine Tools of April & June 2005)

***Identify the value stream:*** It is your vehicle for delivering value to your customer. It is the entire chain of processes to develop, produce and deliver the desired result or outcome. A Lean Enterprise tries to streamline the process at every step of the way.

***Flow:*** Organise the process flow in such a sequence that it eliminates all non-value adding operations.

***Pull:*** This is the concept of producing what is needed and when it is needed. It avoids creation of inventory of any kind by providing only what the customer wants and when he or she wants it.

***Perfection:*** It is the commitment to continually pursue creating value while eliminating and preventing occurrence of wastes.

The Lean Enterprise is typically used to make radical changes to a work process. Therefore 'lean' is a tool used by many managements for rapid improvements.

Six Sigma is a project centric approach, founded in statistical methods with the purpose of producing process improvements. It measures the returns through 'cost of quality'. Although Motorola and perhaps GE too have promised large bottom line benefits, a survey conducted in 2001 showed few actually realised those benefits. Six Sigma uses five implementation steps:

***Define:*** the management first selects the project, a special team identifies the problem, defines the requirements and sets the goal.

***Measure:*** this is used to validate the problem, refine the goal, and establish a baseline to track the results.

***Analyse:*** the potential root causes are identified and the hypothesis for corrective actions are validated.

***Improve:*** here you develop solutions to root causes, test them and measure the impact of corrective actions.

***Control:*** establish standard methods and correct the problems as required. Here the correction action should become the new requirement, but additional problems may occur that will have to be adjusted for.

Six Sigma is used largely as a problem solving methodology (not prevention). Some organisations in their discrete processes may favour a project approach to improvement as it has defined financial benefits and start and finish dates.

The power of Six Sigma

Lean manufacturing concepts

For those unfamiliar, Six Sigma is a series of methods used to manage process variations that cause defects defined as unacceptable deviations from the mean (or target), and to work systematically to manage variation in order to eliminate those defects. The objectives of Six Sigma are to achieve world-class performance, reliability, and value to customers. It has had a profound influence in western manufacturing organisations, but it has also been adopted in service companies, financial institutions, and retailers.

While Six Sigma was originally defined as a matrix for measuring defects in order to reduce their occurrence, improve quality; it has grown beyond defect control. It is a powerful tool for achieving organisational improvement but, like any tool, it must be correctly applied. Understanding how to apply Six Sigma methods properly and effectively is part of the mystique.

However, the inadequacies of Six Sigma seem to offer room for an alternative approach for organisational improvement. Many manufacturing companies have found that alternative in Lean Manufacturing. It is not confined to applications in manufacturing, but that is the first application that was pioneered by Toyota's Taiichi Ohno and Eji Toyoda.

Lean principals concentrate on reducing waste rather than seeking sources of defects.

Lean thinking identifies seven types of wastes, such as: unnecessary capital investment creating excessive production resource leading to over-production and excessive inventory, waiting time, transportation, over processing, movement, and defects. By eliminating waste, quality and productivity are improved and cost is reduced. There also are other Lean 'tools' for constant process analysis, 'pull' production, mistake proofing etc. As a management philosophy, Lean is focused on improving the workplace atmosphere, part of the effort to maintain an effective organisation.

So much has been written and stated about these improvement processes - references, instructions, testimonials, competitive pressure, comments and opinions that are confusing on various blogs - that a manufacturing organisation may understandably ask: Six Sigma or Lean Manufacturing? Which one is right for you? Here are some key criteria for you to consider:

- What is your goal? What is your objective?
- Do you have specific, difficult quality issues that must be resolved?
- Do you have a pressing need for an overall operating improvement?
- Are you looking for a long-term competitive advantage?
- Is cost reduction and cost competitiveness your goal?
- Is your goal to sustain growth and profitability?
- Do you want to be able to sustain price cuts and yet retain your profitability?
- Do you want to deliver better value to your customer?
- Or, are you just looking for an effective method to 'force' improvement into your organisation?

***Look at your option in this case:*** Six Sigma is a powerful tool, specifically designed to resolve complex quality problems. It is not, however, designed to address overall operating performance issues. Lean Manufacturing, on the other hand, is an all-encompassing philosophy that has been designed to address overall process improvement. Lean attempts to optimise an entire corporation. It is a comprehensive philosophy and process, with a portfolio of

underlying techniques.

How soon do you need results? How urgent is your requirement? Are you launching an initiative that will be a gradual, illuminating, 'nice to have' discovery process, or is there a pressing need for quick, substantial results?

Six Sigma is a process that is rigorous, involving, and thorough. It entails a considerable amount of front-end training for your team before any meaningful work on improvement can begin. Lean Manufacturing, when correctly applied, has shown the ability to begin generating noteworthy results almost immediately.

***At the level of employee involvement:*** Are you looking to develop a small elite team of internal gurus? Or, are you looking for a process that involves the entire workforce in the continuous improvement process?

Due to its technical nature and the length of time required to become proficient, a Six Sigma initiative typically focuses resources on building expertise within a selected group of highly trained individuals (these are the people identified as 'black belts'). Shop-floor operators are primarily bystanders in the change process.

Contrarily, a Lean transition involves the entire workforce, and generally results in the formation of 'natural work teams'. It is in these work teams that process improvement ideas are identified and acted upon, often with minimal outside 'expert' involvement. A significant portion of the innovation and implementation of Lean improvements are a direct result of the involvement of the general workforce.

Why not try both? Can a company or organisation effectively make a transition to both Six Sigma and Lean Manufacturing simultaneously?

Transition to Lean environment requires a huge commitment, and focus, from the top of the organisation. Lean is, in most companies, initially a foreign philosophy. The transition typically requires a culture change and a substantial commitment. This is also true of a full-fledged Six Sigma implementation. Attempting to do both simultaneously, will almost always result in neither philosophy being done very well or effectively. In addition, the underlying philosophies can cause some conflict if attempted simultaneously. The classic Six Sigma implementation is a comprehensive re-evaluation that examines elementary details in an exhaustive way with techniques that may seem rigid, as well as rigorous. By contrast, an effective transition to Lean has is reminiscent of Nike's invocation, 'Just Do It': reduce the inventory and in the process fix the problems that arise.

Which one to do first? If it doesn't make sense to attempt to do both simultaneously, is there a reason why one method should be instituted before the other? And if so, in what order? Lean is an overall operating philosophy that is conceived as a way to drive the waste out of the system. The Lean process will expose all sorts of problems. In the Lean 'tool kit' there are a host of techniques that are applied to resolve the problems as they are exposed. One such technique is Six Sigma. The Lean tool kit also contains other quality improvement techniques such as sequential inspection, failsafe, source inspection, etc.

So, if your organisation or process is already operating on Lean Manufacturing principles, then Six Sigma is there in your problem solving tool kit. However, if your organisation is still operating in a traditional discrete mode, doing Lean first will almost always generate much more meaningful results, sooner. Six Sigma is a powerful tool when applied to appropriate quality and process control issues. It is not, however, an overall enterprise-improvement methodology.

The Lean Manufacturing transition process can be used to generate cash and overall global process improvements. Six Sigma methods (available in the lean tool kit) should be then utilised, where it is appropriate, to resolve specific process quality/reliability issues. The single biggest drawback with Six Sigma is that it puts quality only in the hands of a few, where as real quality is not only sustained but continually improved when its put in the hands of the total workforce – as does 'Lean'. With this little input, I hope that those of you either undecided or in that great Indian quandary will now be able to boldly move forward.. MMT

*Sanjeev Baitmangalkar is the CEO of Stratmann Consulting. Consulting in the areas of Lean Manufacturing, BPR & Turnarounds, Supply Chain Management, Industrial Marketing, Machine Tools and product development, provide training in areas of Finance and Leadership, working with overseas and Indian clients. He has also worked as the Director / CEO with the Texmaco Group in South East Asia, and as VP & SBU Head with the Kirloskar Group in India. Has also published articles on various management subjects such as Lean Manufacturing, Leadership, Ethics, Core Competence, Strategy, Process, Team Work, BPR & Turnarounds, and Case Studies etc. He can be contacted at stratmannconsulting@gmail.com*