Lean Six Sigma – the GUTs of improvement?

Many organisations, and particularly those in the manufacturing sector, are looking to integrate their Six Sigma programmes with other improvement activities such as lean manufacturing and TPM. Other companies such as those in the service sector have not historically implemented lean or TPM initiatives but are building aspects of this thinking into their approach to Six Sigma. This article contrasts the different approaches to improvement and considers the case for a more holistic approach than any single methodology can bring.

Six Sigma was pioneered by Motorola and further developed by companies such as General Electric. With almost half of GE's business being outside manufacturing and in financial services through the medium of GE Capital, GE was the first organisation to apply Six Sigma formally to service and transaction businesses. The fundamental essence of Six Sigma is the progressive reduction of defects – outcomes that do not meet the specific requirements of a customer – to a level that is better than your competitors in the marketplace or indeed towards world-class 6.0 sigma (3.4 defects per million opportunities).

The process

This is achieved through a combination of process improvement (DMAIC) or transformation/design (DMADV) projects and ongoing effective process measurement and management. The approach usually depends heavily on process measurement and analysis using statistical process control, hypothesis tests, regression and design of experiment techniques. Whilst there are two basic project methodologies (DMAIC and DMADV, or the like) each project is different and there is no unique pre-configured prescriptive sequence in which the individual tools and techniques are used; indeed the project team are like 'data detectives' and may seemingly unproductively follow up many lines of root cause analysis before discovering the main underlying causal factors. The very power of Six Sigma is in its breadth of application of data tools and techniques, but at the expense of a lack of a simple prescription of approach.

Lean manufacturing

Lean manufacturing was developed in Japan to eliminate waste in manufacturing processes; examples of its application include JIT (just-in-time) to eliminate WIP (work-in-progress inventories) between different manufacturing activities, and value stream mapping to reduce cycle time in processes by adopting a pull (rather than push) system. Unlike Six Sigma, lean thinking suggests that most manufacturing processes suffer common similar problems (waste) that can be systematically reduced or eliminated through a standard prescriptive approach. The toolkit is heavily centred on process analysis and flowcharting/mapping techniques, rather than being data driven.

TPM

TPM (total productive management) was also developed in Japan to optimise the life cycle, productivity and costs of equipment and assets (and then referred to as total preventive maintenance). It has developed into a much extended improvement management system, and organisations such as Volvo Cars Gent – the first winners of the World Class TPM Award – have applied the philosophy and approach to all aspects of management.

TPM is based around a number of 'pillars', one of the basics of which is the elimination of all 'losses'. Whilst it is initially tempting to translate 'losses' as 'defects' in the Six Sigma definition of that word, 'loss' is much more encompassing – referring to any situation which is not ideal, even if this is not yet causing a 'defect' to occur. A 'defect' refers only to the output of a process (and to a non-conformity viewed through the eyes of a customer); by contrast a 'loss' can refer also to an input or factor in a process – for example a loose electrical lead or fluid pipe, or a frayed wire. Such 'losses' may eventuate in a problem resulting in a defective output ('defect'), but TPM requires that these are identified and corrected long before such a defect actually occurs. In essence this is a 'zero tolerance' approach to problems – the Rudi Guliani style of management. Of course TPM is much more than this – but I hope the reader has some sense of the essence of how it differs from the other approaches.

GUTs

Unlike physics which has its GUTs – or should I say Grand Unified Theories – of the world, the universe and everything management and leadership theory often seems to be composed of, many different practices are seen to be rivals to each other. But improvement perhaps has its GUTs too – and this is seen in the trends to develop lean Six Sigma or other unified approaches to improvement.

The best form of cure is prevention, so the best solutions to process improvement are likely to include TPM style approaches. Many initial Six Sigma improvements to business processes – particularly in service and transaction processes – arise from the application of process mapping and analysis techniques to identify root causes (the 'process door' in the analyse step of DMAIC), rather than from the data collection and statistical analysis techniques (the 'data door' in analyse); it is only once these 'low hanging fruit' improvements have been made that the more sophisticated data analysis techniques come into their own.

In manufacturing processes such gains have already largely been made during 'lean' improvements, and so Six Sigma tends to rely much more on the data door approach; by contrast most businesses have yet to apply lean thinking to service and transaction processes (even those companies in the manufacturing sector), and lean is often 'adopted' within the process door and integrated into the Six Sigma programme directly by enhancing the process tools with value stream analysis and other relevant techniques. Volvo have gone further and integrated their Six Sigma and TPM systems into an overall approach they term 'Perfection Focus' – perhaps this is indeed the holy grail of business improvement mechanisms.

About the Author

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> **"The fundamental essence of Six Sigma is the progressive reduction of defects"**