



six sigma analysed

Six sigma works - it delivers impressive reductions in cost and, potentially, improvements in customer satisfaction by increasing performance and reducing variation. But there is much more to six sigma than cost reduction. Professor Tony Bendell and Ted Marra explain why

The six sigma approach works. At the macro level, before the end of the twentieth century and with less than five years' experience of applications, GE was reporting benefits of over \$2,000 million. In the UK, it has been possible to witness individual project savings in excess of £350,000 even before six sigma training is complete. Indeed, one client used the approach as a lynchpin to win the prestigious factory of the year award. However, whilst it is good, the approach is not perfect and, in common with most quality approaches, a dichotomy has developed between what is said and what is done.

In many ways, despite the American hype, there is nothing fundamentally new in six sigma. It is just a very clever package with all or almost all of the right ingredients, and a project and company-wide infra-

structure to hold the programme together to make sure it delivers the desired payback. It focuses around Juran's concept of project-by-project improvement with clear responsibilities and authority; and before and after performance measurement, typically on a cost basis. It also relies (for its power) on the use of 140 statistical tools and concepts to effectively define, measure, analyse and control variation. The DMAIC project methodology - with project stages 'define', 'measure', 'analyse', 'improve' and 'control' - is particularly effective for manufacturing and simple transactional processes - especially when an additional 'transfer' stage is added at the end to spread the learning to other areas.

Clever too is the training approach, whereby black and green belt candidates have a project selected prior to training, work on it between the training modules (which

typically last four days and are three to four weeks apart) and subsequently need to demonstrate externally validated savings/payback before having their initial projects signed off and achieve black or green belt status. Typically, a black belt will train for 20 days and a green belt ten to 15, but the integrated project approach ensures that the transfer of theory to application takes place quickly and effectively. Another key ingredient is the on-site mentoring, whereby experienced 'master black belts' provide support to their less experienced colleagues within a rigorous reporting framework.

It's about the customers - or is it?

Apart perhaps from the lack of genuine originality in the six sigma package, the dichotomy between what is said and what is done is most apparent in the context of



Figure 1. Causality with six sigma objectives

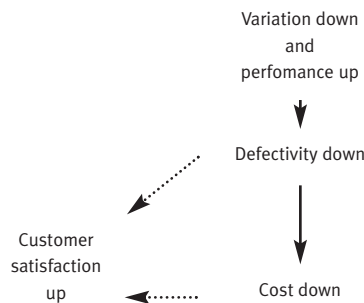


Figure 2. The simplified cost down operational model

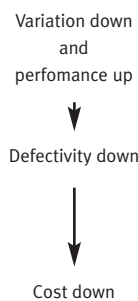
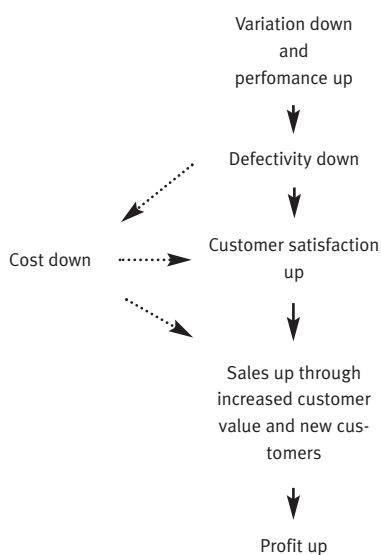


Figure 3. An alternative six sigma causal model



the projects that organisations pursue. The six sigma ‘gospel’ says that it is fundamentally about customers - customer expectations and customer satisfaction. Jack Welch, former CEO of GE, for instance, is on record as saying that the six sigma approach has taught GE employees about the importance of fulfilling and surpassing customer expectations. If you talk to black and green belts, however, you get a different view - the major driver in project selection is ‘cost down’. This is true in much of the car industry but also in food, electronics, financial services and all the major application areas.

It is important to emphasise that in the six sigma model, cost down is not necessarily at the expense of quality down, as it may have been historically. Rather, by concentrating on control and reduction of variation and hence defectivity, cost is reduced and customer satisfaction simultaneously increased (see figure 1). Sometimes, however, all the real emphasis is on cost (see figure 2). In spite of this, there is much more to the customer satisfaction dimension than cost reduction. The institutionalisation of six sigma to the cost down model results in too narrow a focus on the traditional statistical toolkit and approach to implementation. Consequently, we believe major improvement opportunities are being missed.

Beyond cost down

Going beyond cost down requires us to think beyond the cost elements of projects, such as the typical 3:1 recurring return on investment ratio often looked for and quoted. Clearly, while it is important, cost down should not be the sole driver of projects. The issue here is that cost represents an important aspect of process efficiency - but does not, in itself, answer the effectiveness question as to whether you are providing the right product or service.

Whilst everything that has been said so far applies to both manufacturing and service applications, there is more room for distortion with cost down thinking in administrative and transactional areas. In manufacturing, it is legitimate to focus on the efficiency rather than the effectiveness

question, since such questions are often outside the remit of the department. In these cases, the costs of manufacturing and quality can be brought together into a single total cost metric, which can be minimised. This is not the case for administrative and transactional areas, or indeed any service-focused organisation:

Figure 4. Sources of profit

- Profit = gross revenue - cost
- Gross revenue = revenue from retained customers + revenue from new customers

Figure 5. Sources of revenue

- Retained customer revenue = average number of retained customers X retained revenue
- New customer revenue = average number of new customers X new customer revenue

emphasis on cost down can seriously distort business priorities by missing other chances to increase profit (see figure 3).

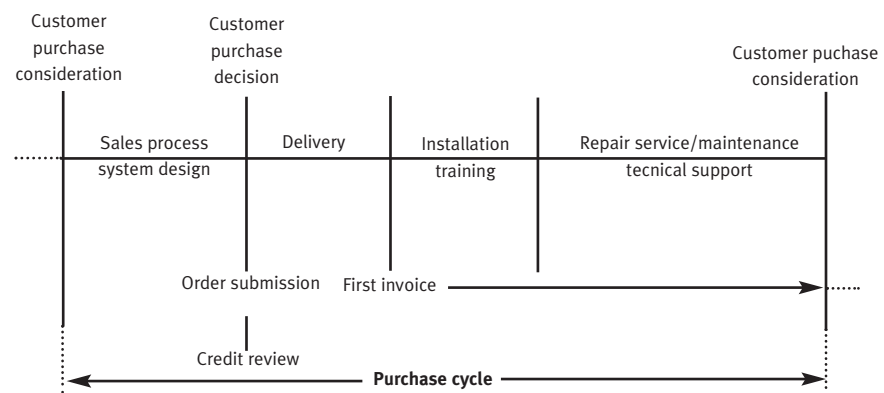
The emphasis on cost reduction is only one side of the profit equation (see figure 4). Profit is the surplus of gross revenue over cost and this in turn can be divided into the contribution from existing and new customers (see figure 5). Studying the profit equation shows three areas of opportunity for six sigma projects in customer-focused organisations. These are:

- reductions in costs
- increasing customer value to the business
- increasing customer base - if the market is constant, this would equate to increasing market-share

Which of these three opportunities you focus on largely reflects the culture in which you are working, but it may make a major difference to project activity. For instance, in a call centre the traditional ‘minimisation of cost’ project would probably lead to consideration of reductions in call times, whilst a ‘profit maximisation’ approach may lead to consideration of increased call duration to lead to increased customer value and market share.




Figure 6. Managing the customer relationship: customer experience map
‘Telecommunication systems manufacturer’



The traditional six sigma approach focuses on cost and time minimisation, which is applicable in both manufacturing and service industries. The traditional DMAIC project approach works for cost down projects but does not fully suit customer value and market share driven projects where the stages are less linear and more integrative. In addition, the organisation and roles within six sigma programmes can reinforce functional barriers and may encourage an emphasis on efficiency rather than effectiveness. This leads to sub-optimal solutions. Whilst cost down is clearly measurable than the other results categories of customer value and market share, which are slower to respond and more affected by other influences. Such projects may also require more creativity and lateral thinking than traditional cost down projects.

The above analysis suggests that emphasising profit maximisation rather than cost minimisation does not only imply that six sigma projects should take place in sales and marketing rather than just manufacturing, but also that different types of project and project team are required to respond to maximisation of customer value. Projects and project teams should no longer be so artificially confined to single functional areas, but will need to become multifunctional in nature and broader and bigger.



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Ted Marra is president of Marra Quality Inc, which is a partner with the Centre for Competitiveness in Belfast, BQF in London, the Centre for Excellence in Helsinki and many others. He now spends 80 per cent of his time in Europe. Together with Professor Bendell, Marra has integrated his knowledge of six sigma with his customer approaches to create a leading edge 'customer focused six sigma' concept. This concept is an integral part of his company's performance excellence practice. He views six sigma with a balanced focus, blending both the operational and the strategic aspects.

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So what to do?

How do we implement this broader concept of six sigma? Keep the six sigma infrastructure - the project basis, clear responsibility, integrated training etc - but extend the toolkit and methodology.

Strategically, the starting point, whether your organisation is new to six sigma or very experienced, is to take stock of your objectives or desired outcomes. The next stage is to think through the causal theory connecting your desired objectives or outcomes to the processes of your business.

Then and only then is it meaningful to define required process performance standards and metrics. These then become the basis for scoping projects and monitoring success. Thus six sigma becomes no different to other improvement methodologies or approaches, relying on policy deployment/Hoshin Kanri (Japanese for policy management). The toolkit does, however, need extension. A number of new customer-facing tools come to the fore including the customer experience map (see figure 6). Customer-focused six sigma is not fundamentally different to traditional six sigma, it is just more sensible and less limited. But it does need a cultural change and a less functional way of organising - and it's worth it .