

David and Goliath: Optimisation 3D™ and Six Sigma

“We invented management; it’s now up to us to re-invent it”
Dr W. Edwards Deming



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About the author



Stuart Swalwell worked in education and training design and then joined Rolls-Royce plc where he specialised in management development, lean production and process improvement. He has a master's degree in Organisational Behaviour from the University of London. He joined Status as an Associate in 2009. The approach he brings to training and coaching is rooted in the thinking of Dr W. Edwards Deming.

From the author

Thank you for downloading this free briefing. This series of briefing papers represents the culmination of consultancy findings and research effort. Our hope is to educate and inform so that you can become both familiar and comfortable with ideas that may be new to you or simply to re-acquaint you with forgotten ideas. After reading, you will have, hopefully, set up strong foundations from which you will be in a position to move forward with your aims and ambitions.

Finally, I would greatly appreciate any feedback to mwoods@status.co.uk

Introduction

Since the invention of management over a century ago, management has become detached from both the day to day operation of the organisation and from delivering value to the customers who pay for it.

Conventional wisdom is that managers set targets and then create systems to monitor, measure and control the execution of these targets. These systems include budgets, performance management, incentives and appraisals, which are used to exercise control and ensure that targets are met. Simple, obvious and wrong!

We need a change in management thinking.

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What is Six Sigma?

Over the last few years Six Sigma has become popular in organisations. Some companies have reported savings running to hundreds of thousands of pounds by using it. But now there are murmurings of disquiet. Customers have commented that they haven't noticed any improvements. Senior management is not convinced many of the claimed savings are real ones. Some commentators have likened Six Sigma to, essentially, the same old soup in a different can, or the same old car but with a different salesman.

This paper sets out to explain and examine Six Sigma. It will then look at Optimisation 3D™, a holistic programme offered by Status Management Services Limited, and make comparisons. The term "part" is used in this paper to refer to a "thing". So, if you work in medicine, a "part" could be a lung or a heart or the brain; a part becomes "part of" something else. So the lungs, the heart, the brain are part of the body. If you work in accounts, a "part" might be a time sheet or a purchase order or a contract; these parts become part of an invoice. If you work in production, a part might be a component. Each component becomes part of a sub-assembly.

Operating your company at "Six Sigma" certainly sounds alluring. But why six? Why not eight? We need to go back to 1986 as a reference point. Motorola first coined the term and their website provides the following definition:

"A defect rate of no more than 3.4 parts per million; statistically, allowing for some variation in mean, this approaches zero defects. At Motorola, we actually have a measure for quality which we call "Six Sigma" and this literally affects everybody and everything we do, every minute, of everyday. Six Sigma is basically a target based on zero defects per million manufactured parts. At present we are hitting 99.9996%, which is so close to perfection that we are now using a parts-per-billion measure for defects."

So we can see an emphasis on zero defects. What manager would vote against that? Customers don't want to receive defects. You would not want to swallow the wrong pills given to you by your chemist! You don't want to receive an invoice that has mistakes on it.

Allied Signal and then General Electric (GE) followed Motorola and started their own Six Sigma programmes. Jack Welch, CEO at GE, proclaimed to his shareholders that cost savings ran into hundreds of thousands of dollars and this encouraged other companies to take up Six Sigma programmes.

¹ The 3.4 defects per million opportunities will occur if all the data points fit within six standard deviations from the mean of the process out to the specification limits. But the calculation allows for a 1.5 shift in the process to take account of the variation inherent in processes all the time. So we are beginning to enter the realms of numerical jabberwocky here! And, of course, you can get a better result if you merely widen the specification limits!

The mathematical calculations used to calculate the defect rate of 3.4 defects per million (and thus representing Six Sigma) were reported by Don Wheeler, a leading American statistician, “as representing a triumph of computation over common sense”. The detail is shown in Footnote 1. It is sufficient to say here that the process mean can vary quite considerably over time resulting in variation in output but you can still be a six sigma company! Your accounts department may have a target value of ten days to process an invoice. The natural variation in the process may show that this could vary between thirteen days and seven days. A Six Sigma process would allow this variation to extend out to fourteen and a half days!

Imagine if you were the customer receiving products or services that have a large amount of variation! Would you be happy? Have you recently tried to open a bottle with a screw top? Some bottles have tops that are so tight it requires brute force to unscrew, yet similar branded bottles can have tops that require a minimum of strength. Would you not prefer to receive bottles that can be unscrewed easily; neither tight nor loose?

Reducing variation is the key issue. Of course, you could have a quiet word with the process designer and ask him or her to increase the specification or tolerance widths so that your process sits more comfortably in the centre allowing you to claim you are a six sigma company.

Reducing variation is a key element in any improvement effort. Dr Deming, one of the leading management and quality thinkers of the 20th century, said “shrink, shrink variation - to reduce the loss”. We’ll return to this quote later.

The 7 Quality tools - (Histograms, Cause and effect diagrams, Check sheets, Pareto diagrams, Flow charts, Control charts, Scatter diagrams) - given to us by Dr Ishikawa, a highly respected Japanese quality leader, were regarded by him as suitable for solving 95% of our problems and so one might have thought that Six Sigma programmes would concentrate on them. They certainly use them but they have added a plethora of statistical tools. One person reported that their training in the tools was akin to “drinking water through a fire hose”. Many of these tools are suitable only for enumerative statistical studies where you are studying a fixed “frame” of material with no regard to the time order. Your report may be of academic interest but, because it cannot predict future performance, is not helpful to the practitioner. An analytical statistical study using a control chart would be far more helpful. Based on the pioneering work of Dr Shewhart in the 1930s, this chart plots your data in time order, calculates your control limits (limits of natural variation) and then predicts the process performance you can expect in the future.

Six Sigma programmes can be identified by their belt system together with associated projects that are rigorously controlled using a DMAIC methodology (Define Measure Analyse Improve Control). Selected people are appointed to roles based on the martial arts -

black belts, green belts, yellow belts - and extensive training is provided. Often a Master Black Belt will oversee the projects carried out by these belts. Solving problems becomes the preserve of this elite group.

The results from companies who have adopted Six Sigma are not encouraging. The stock market performance of many companies, including Ford, General Electric, Motorola, Delphi, Home Depot, 3M, has fallen dramatically. In the UK, Rolls-Royce moved away from its drive to Process Excellence through teamwork, customer focus and process improvement to embrace Six Sigma and Black Belts six years ago. Whilst their share price has risen slowly, recent quality problems may indicate their change of focus has been detrimental to long-term quality performance.

The earlier quotation from Dr Deming about “shrink, shrink variation and reduce loss” has its roots in the work of Dr Taguchi. His definition of quality was “the minimum of loss a product causes to society after being shipped”. Taguchi showed with his Loss Function parabola that the further you move away from the target value the more loss, and thereby cost, is incurred. He was demonstrating the difference between just making a “part” and making something a “part of”. Six Sigma focuses on getting the part within the specification but it doesn’t concern itself with how well it fits into another part and it doesn’t focus on improvement of the part by reducing its variation around the target value.

Six Sigma encourages a thinking of “acceptability”. If a part is within specification, it is “acceptable”. Such thinking may provide for customer satisfaction but it does nothing to encourage a drive for achieving customer delight i.e. the customer receiving more than they would have expected. Delighted customers return for more and they often tell others. But to achieve customer delight a company would have to start studying the “good” parts, not just concentrating their energies on the “bad” parts. Could the good parts be made better? Could they be improved? Could the variation in good parts be reduced?

Six Sigma encourages management by objectives and numerical target setting, but, as Brian Joiner points out, if you set a target which is outside the capability of the current system then you are encouraging people to distort the system or distort the figures: where there is fear in the organisation, people will always hit the targets set by management by one means or another!

Optimisation 3D™

Status has set out an Optimisation 3D™ programme which is based around “desirability” rather than “acceptability”, where continuous improvement is a driving force and where teamwork is paramount for success. A comment from Donald Wheeler in 1992 puts a spotlight on some of the thinking behind the development of Optimisation 3D™ :

“Conformance to specifications, Zero Defects, Six Sigma Quality, and other nostrums, all miss the point”.

So what is the point?

The point is that there is little focus in Six Sigma on continuous improvement. Once a part is acceptable, that is it – even if there is considerable variation between the parts! And there is too much focus on the part itself without recognition that a part becomes “part of” something else. How does the customer (internal or external) view the quality of the incoming part in terms of its fit with the next part?

Conformance to specifications, Zero Defects, Six Sigma Quality, and other nostrums, all miss the point

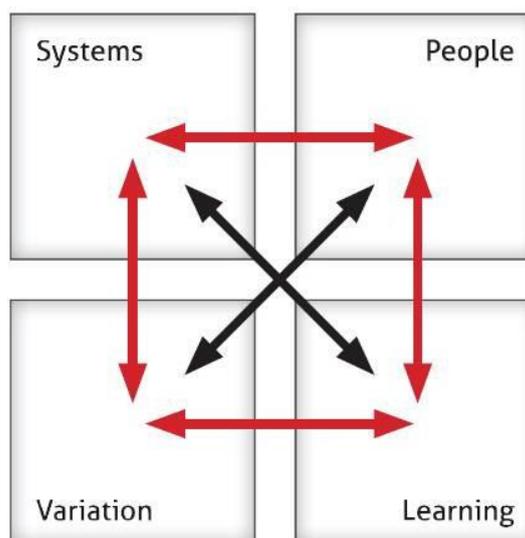
This integration or inter-connectedness is as relevant for service industries as it is for the manufacturing sector. Work is moved on from one section to another section or from one department to another department. For example, in the NHS there has been a lot of work undertaken recently to map the patient journey from diagnosis to full recovery so that staff can see how their particular contribution fits into the whole and over a time span.

- 1 Optimisation 3D™ takes a holistic view of an organisation. Management is encouraged to view its organisation as a system of inter-related parts/departments/functions. Time is taken to study the interactions and inter-dependencies because this is where most problems occur.
- 1 Optimisation 3D™ is customer focused. It concerns itself with not merely meeting the wants and needs of customers but delighting them. This is far more than just satisfying customers!
- 1 Optimisation 3D™ is team focused. It stretches out to incorporate all the people working in a process, not just a chosen elite group of belts.
- 1 Optimisation 3D™ uses a systematic method. It studies data through the use of control charts so that future performance can be predicted. It uses the Plan-Do-Study-Act cycle to test improvements before they are implemented.

Optimisation 3D™ provides a theory by which to manage an organisation as one company. It is guided by the thinking of Dr Deming who provided a lens through which to look into organisations and a map of theory by which to understand the organisations that we work in.

This outside view – the lens – has 4 parts, all of which are inter-related as detailed below.

1. Appreciation for a system – awareness of the interconnections and interactions between all parts in a system (your organisation) and the knowledge that no one part is more important than another.
2. Knowledge about variation – awareness that variation is all around us in the performance of all products and processes and that we can use statistical analysis through control charts to help us predict future performance.
3. Theory of knowledge – awareness that all actions are based on a theory for prediction and that management is prediction.
4. Psychology – awareness of people as part of a system, with their needs to be valued and listened to, and how any fear that they have can distort the system.



Conclusion

Optimisation 3D™ has many similarities to Six Sigma in that both use data and statistical analysis. But there is a philosophical difference between the two! Optimisation 3D™ provides a holistic approach to improvement in an organisation. It uses the 4 inter-connecting principles, as shown above, to provide an in-depth analysis of organisational behaviour. In this way, it provides a platform for transformation of the organisation into a more efficient, effective and profitable entity.

Taking action

To paraphrase an observation from Deming: often, those in management know everything about their organisation except how to improve it. There are, however, systematic and structured methods with which to improve an organisation and Optimisation 3D™ is one of them.

A key step in the process of adopting an optimised approach is likely to include the creation of a cross-functional team from all the relevant levels of the hierarchy to:

- Determine the purpose of the system i.e. what are the benefits and capabilities that your customer gets through interacting with you?
- Flow chart the process and understand where waste occurs
- Establish if the causes of waste are predictable: if they are predictable, they are preventable
- Align performance measures to the purpose of the organisation
- Present all performance data in a “time series” to show the full range of variation experienced. (A “time series” is essentially a diary of events shown on a graph which uses numbers instead of words.)
- Focus the team on reducing waste and variation
- Manage the flow of work through the system
- Change roles and responsibilities so that they the team are engaged in managing the flow of work

Benefits

The benefits of Optimisation 3D™ are many and varied and include:

- Customer satisfaction significantly improves.
- Staff motivation and productivity improve as people are allowed to help customers solve problems and improve the way in which their work works.
- Repetition, duplication and delay are reduced and wasted time and effort eliminated from the system.
- Essentially, the focus shifts from “acceptability”, making the numbers, to “desirability”, meeting the purpose, learning and improving.

Essentially, if the system is designed to meet the work that the customer values, cost will fall as service improves - counterintuitive and proven.

Status can show you and your people how to understand and optimise the processes within which you work

Implemented properly, managing an enterprise using Optimisation 3D™ can deliver staggering results.

How much has this paper whetted your appetite for optimising the way in which your work works? Engage with us and become part of the story! For a consultative meeting or additional information, please contact Mark Woods on 07976 426 286 or email him at mwoods@stadius.co.uk.

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Additional Resources:

Are you in chaos, clarity or confusion?
Review your organisation's performance;
take 10 minutes with the Status Coffee
Break Challenge at:



www.status.co.uk/coffeebreakchallenge

The Coffee Break Challenge is a questionnaire which been designed to provoke thinking about your organisation's current performance. Be honest with yourself. It is deliberate that there are no scores: the challenge is designed to make you think. There is no one looking or checking!

Additional Briefings:

It's broken – Housing repairs and other field service operations

An examination of systems thinking as applied to housing repairs and other field service operations. In the housing arena, a plethora of Government targets is actually hampering the effort to improve. This paper seeks to return to basics, that is, to define the "purpose" of the system and, from there, create management systems that deliver value to the tenant or client.

Easy Meat? Cutting the Fat in Construction

The purpose of Lean Construction is to increase capacity by designing the construction process to optimally respond to customer demand. So, if an organisation can cut even just small chunks from the 55-65% of work that the Lean Construction Institute estimate is used to produce waste, staggering results can be obtained. This paper explores that debate.

Creating competitive and compassionate contact centres

Contact centres play a critical role in many firms and sectors. However, they are often labelled as the "sweatshops" of modern business industries offering repetitive, pressured and boring roles with little, if any, career progression. This paper applies systems thinking to contact centres in order to create competitive and compassionate environments.

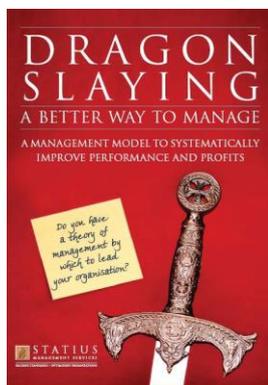
Targets, goals and other management myths

Conventional wisdom is that managers set targets and then create systems to monitor, measure and control their execution. These include budgets, performance management, incentives and appraisals, which are used to exercise control and ensure that targets are met. Simple, obvious and wrong! This paper sets out a systems thinking alternative.

Are you the lucky one?

This paper undertakes an examination of performance appraisal systems and of merit rating in particular. It uses "The Red Beads" thought experiment to highlight the issue of the "natural variation" that exists within any process and the folly of assigning good, or bad, results to individuals instead of to the system.

Dragon Slaying



Dragon Slaying is Mark's long-awaited book which picks apart a number of management myths. The benefits in adopting the ideas in the book are:

- 1 A more informed understanding of how an organisation delivers value to customers and stakeholders; how the work in an organisation works
- 1 The development of a strategy for "Listening to Customers and Stakeholders"
- 1 The development of the organisation in which everyone's efforts result in:
 - o Improved performance
 - o Less stress
 - o Improved profit