

The Theory of Variation

Part 1: Understanding variation

John Seddon's blistering attack on ISO 9000 in the last issue of COMMERCE was based on his conviction that registering to ISO 9000 makes businesses worse-off. This month John begins a series on the better way, beginning with a practical guide to the theory of variation. In next month's issue he will focus on the do's and don'ts of being customer-driven.

In 1979 we would have been better off if we had introduced managers to the theory of variation, rather than coercing them to register to BS 5750 (subsequently ISO 9000).

The theory of variation has been at the heart of World Class manufacturing since the 1950s and it has had an astonishing effect. For example, did you know that the number of man-hours involved in making the Toyota Lexus is LESS than the number of man-hours consumed in re-working a top-of-the-line German Luxury car? If you have ever wondered why it is that Japanese cars break down less than most others, it is due to their adoption of methods derived from the theory of variation. In simple terms, they gave up making things 'within tolerances', instead making things 'more and more alike', reducing variation and thus reducing the chances of failure. But the theory of variation does not just apply to manufacturing. Let's begin our exploration of what the theory means in practice with the simplest of cases.

Suppose I work for you. Last week I produced X and this week I produce Y:

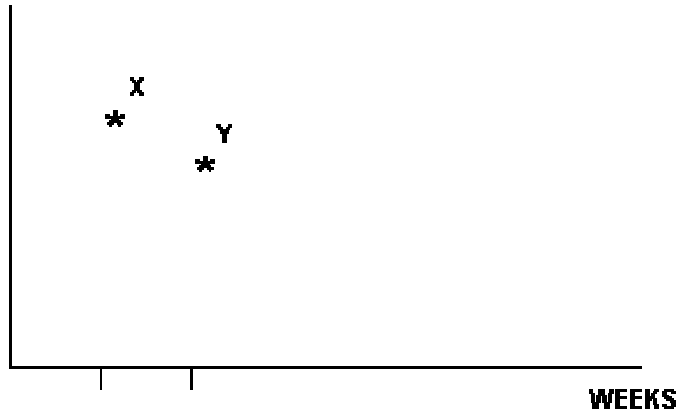


Figure 1 - John's results

What would happen to me? In the 'bad old days' of authoritarian management, which is suppressed rather than absent from most organisations, you might have turned up and beat the c**p out of me. In these modern times we are told the role of a manager is 'coach', so now you turn up and give me therapy. My problem is that you turn up.

The variation in my performance is almost entirely down to my system, not me. If you plot my performance out over time you will find that I can be expected to produce between A and B forever and

a day, unless something in my system changes. This is the first principle of the theory of variation - we should expect things to vary, they always do.

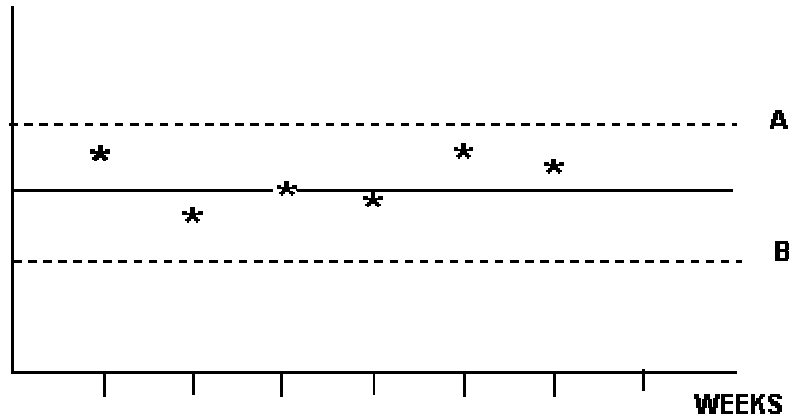
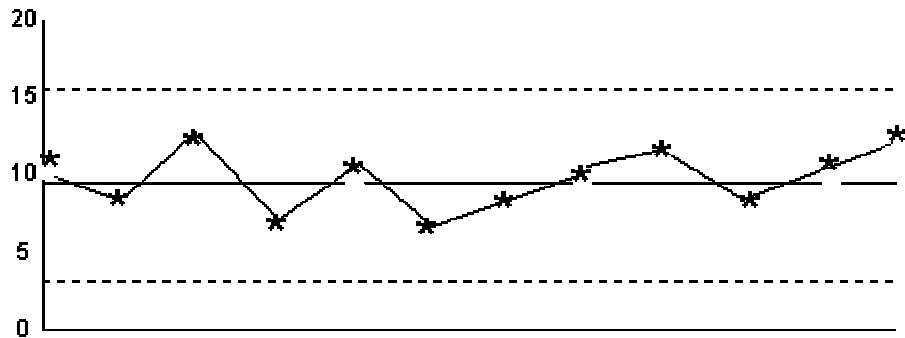


Figure 2 - John's results

However, managers typically act as though they do not expect things to vary. They set targets or standards and react to people's failure to meet them. Here is a table illustrating sales achieved during one day by a telesales team:

Jerry	10
Ruth	9
Tom	12
Claire	6
Pat	10
Edward	6
Richard	9
Chris	10
Phil	11
Terry	9
Anne	10
Jean	11

How would a manager typically react? Pay attention to Edward and Claire, give a prize to Tom? But what would we see if we plotted these results in a control chart?



U.C.L = 15.9

Mean = 9.4

L.C.L = 2.9

Figure 3 - Sales in a control chart

Sales are stable but showing wide variation. The control chart shows that sales per person could be as high as 16, could be as low as 3 and we should expect an average of 9.4. These are the results that should be expected from this sales process, the limits (3 and 16) are derived statistically from the variation in the observed results.

This is the second principle of the theory of variation - understanding variation will tell us what to expect. If nothing changes in the telesales organisation we can expect sales per person to be as low as 3 per day and as high as 16 per day, but more often sales performance will be around the mean (9.4).

The big question is WHY? To find the answer we have to look at the telesales process. A simple way to do this is to ask the salespeople the following questions:

What do you need to achieve your purpose (i.e. sell over the 'phone)? How 'good' are these things now (1 = lousy, 10 = excellent)? What stops you achieving your purpose? How much of your time is consumed by things that stop you achieving your purpose?

The results were as follows:

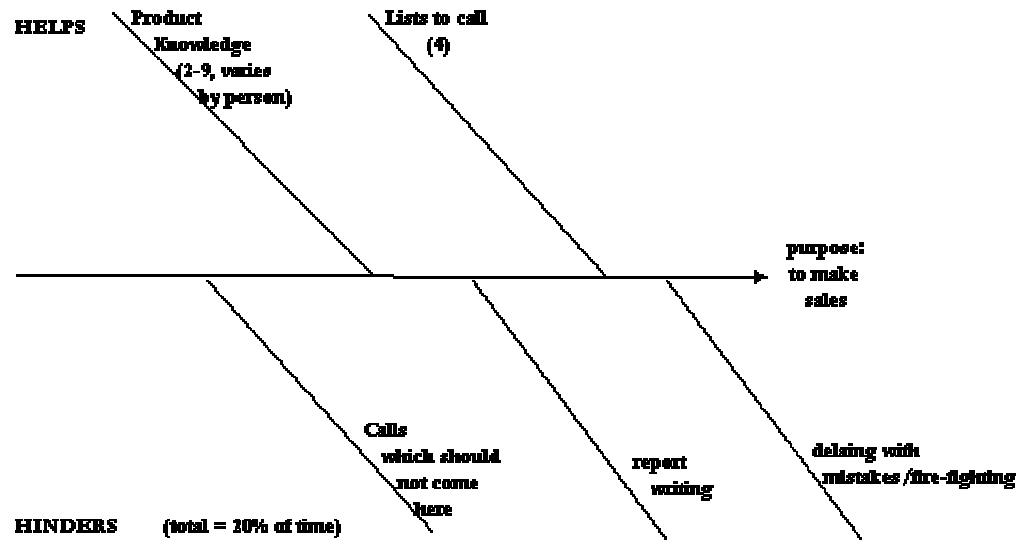


Figure 4 - What affects achievement of purpose?

Now we know something about the causes of variation. The 'worst' cause was the quality of lists. If managers want to improve sales they would be far better off working on these causes - improving product knowledge, improving the quality of lists, removing incoming calls which are not for telesales, removing the causes of mistakes and so on - rather than treating individuals as though they were different. If everything that 'helps' was '10' and everything that 'hinders' was removed, what would happen to sales?

This is the third principle of the theory of variation - understanding variation leads to improvement, it leads us to work on the causes of variation, which are always found in the system.

But most managers don't think that way and they behave as though the day-to-day differences are down to differences between operators. In this case the manager of the telesales team had offered a bonus if salespeople achieved a daily target of 10 sales. What did salespeople learn to do? Anything to achieve a bonus. In practice this meant 'cheating' - hiding good quality lists and using them when they are likely to 'fall short', sending goods on approval and recording it as a sale. In turn, these types of actions cause further problems for the organisation: hiding lists means greater chances of lists being duplicated (as they all came from the same master list), hence customers being called more frequently than they would like; sending out goods on approval results in greater costs of handling and more customer dissatisfaction when accounts chase for a payment assuming it was a firm order.

Which takes us back to where we started. By reacting the 'wrong way' to measures, managers make things worse. This is not learning, it is no more than avoiding grief.

Which brings us to the fourth and most important principle of the theory of variation: understanding variation tells you when something has happened. This is crucial for learning and performance improvement.

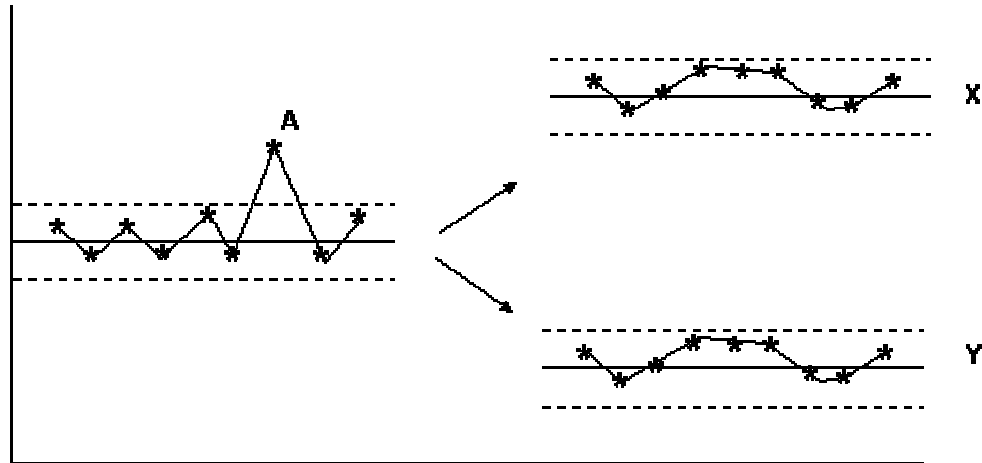


Figure 5 - What has happened?

A is a one-off and should not lead us to change the process. X and Y represent changes, one for the better and the other for worse.

Telesales organisations are one example of what are now known as Call Centres. There are generally two types: sales and service. Call Centres have been given the sobriquet "SWEAT-SHOPS OF THE NINETIES". Just like their manufacturing predecessors, they have been set up on the basis of mass-production principles, ignoring the theory of variation. Call Centre operators are measured on call activity (time on call, number of calls and so on) and differences are assumed to be attributable to operators. Some are, but where they are not, operators become disheartened at their inability to avoid unhelpful attention from management. To avoid attention they learn to cheat, only further dampening their pride.

Just as with manufacturing organisations, Call Centres can become World Class operations, but that depends first and foremost on dropping the notions of activity measures and standards and instead utilising the theory of variation.

The theory of variation helps us understand when there has been a genuine improvement in performance - a change which improves the level of performance. Using the principles of variation in Call Centres often leads to more than 100% improvement in sales, efficiency and/or service. Quality improves productivity. It is a better way.