



Briefing Paper

Applying Science to the Art of Management

Better decisions from better data



“Information is random and miscellaneous, but knowledge is orderly and cumulative”
Daniel Boorstin

American historian, attorney and writer, appointed twelfth Librarian of the US Congress



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About the author

Mark Woods is an apprentice served, degree qualified, engineer with masters degrees in engineering and management. Mark is a consultant and trainer who specialises in raising standards and optimising organisations using a range of tools, techniques and standards, the core of which is systems thinking.

Mark has presented on a variety of subjects throughout the UK and internationally and is a regular contributor to a range of publications, usually contributing under the banner of “Management Matters”.

He is founder and managing director of Status Management Services Limited.

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.

Processes

There is relatively universal acceptance that the objective of collecting data on organisational performance is to:

- 1 Convert information to knowledge and communicate it
- 1 Facilitate decisions and take appropriate action (appropriate action might be to do nothing!)
- 1 Establish if any action taken has had the desired effect
- 1 Provide a check on current performance

This short paper, therefore, seeks to answer two critical questions relating the above objectives:

1. Does it really work like that and are our current processes for data collection and analysis delivering what we really want?
2. Is it possible to apply more science to the art of management?

Most organisations set objectives, goals and targets and then want to measure the results, against which performance will be evaluated. These objectives, goals and targets may be dictated by external parties, most notably customers and stakeholders, but also regulatory authorities. They may also be set by the organisation, the boss or even ourselves. These are the things that we want to do, or someone else wants us to do; often termed the “voice of the customer”.

In order to monitor progress on objectives, goals and targets, organisations will often compare this month’s figures to last month’s figures, and those figures to the same figures from the previous year. However, this practice has a number of critical flaws associated with it:

1. Most of us find it difficult to remember what we were doing last Tuesday let alone last month or last year!
2. It is assumed that previous figures were “normal” (whatever that means).
3. It also assumes the current figures are following the same behavioural pattern as the previous figures.

If you can’t remember what you did last Tuesday, can you really remember what went on this time last year and can you remember if it was “normal”? Additionally, what is the basis for making such comparisons? Why would, or should, these comparisons provide any added insight? This practice may have common currency, but does it make common sense? It certainly makes no scientific or statistical sense – especially in a management report!

Using the voice of the customer in isolation, and comparing it to the results achieved, will allow you to establish if the outcome is acceptable or not. However, it will not tell you:

- 1 how to achieve acceptable outcomes; nor
- 1 how to avoid unacceptable outcomes.

“The voice of the customer will tell you when you are in trouble, but it will not tell you why you are in trouble, and will not tell you how to get out of trouble.”² Objectives, targets and goals allow action to be taken but they don’t help to influence the results.

There is a better way

Making the comparison between two, or even three, figures misses the point that there is variation in all processes. Making comparisons in this way can also lead to a “blame culture”. Numbers in a process go up and down and, every now and then, we get a number that is the highest or lowest for some time. The question is, are these particular numbers any more important than any of the others or are they just part of the day-to-day “noise”? Additionally, some processes display predictable variation whilst others exhibit unpredictable variation. When we view all of the data across the whole of the time period of interest, and complement the picture with a bit of maths to establish the limits of “natural variation”, we can see how predictable, or otherwise, a process is.

Essentially, all data contains “noise” and the job of management is to:

1. Spot the signals amongst the noise
2. Reduce the level of noise which will make the behaviour of the process and system more predictable.

So, if the desire is to improve a process or system, or to move the process closer to the customer requirements, first you need to understand the process or system being studied; that is, you need to understand all of the things (inputs) that influence the results obtained (outputs). Then, to improve it, you need to change either the inputs, or the system or process. The next step is to check the results to see if they have had the desired effect. Therefore, the data need to be seen both before and after the changes were made. This is the process of continual improvement.

This can be done by placing the data in a process prediction chart™. The user can then take action on the process and **know**, scientifically and statistically, if the action has led to an improvement. It is the process prediction chart™ that shows us the “voice of the process”.

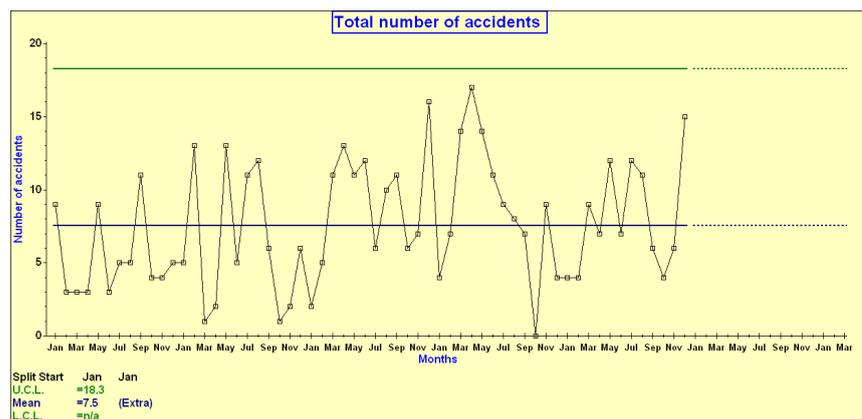
- 1 The voice of the customer defines what the customer wants and expects from the system
- 1 The voice of the process defines what you are currently getting from the system

They may not be the same thing!

Taming complexity

We also need to consider cause and effect. If we take, as an example, the number of accidents on a construction site, the issues that influence the accident rate will include the competence, skill and experience of the site manager, site staff and subcontractors; client and deadline demands; the demands and quality of the programme; the type of work being undertaken; the weather and much, much more. In one exercise, over 40 items influencing safety were identified in less than 15 minutes. The relationship between cause and effect is usually considerably more complicated than we tend to imagine but it is (usually) eminently capable of being tamed.

As a large number of small changes are made to the inputs and to the various steps in a process, consistency improves; as variation is reduced in one step, the next, and subsequent, steps become easier and easier... improvement processes work a bit like compound interest! There is rarely a magic bullet. Improvement is usually a case of gradually changing the way in which a number of things are done; the key to seeing the improvement is the Performance Prediction Chart®.

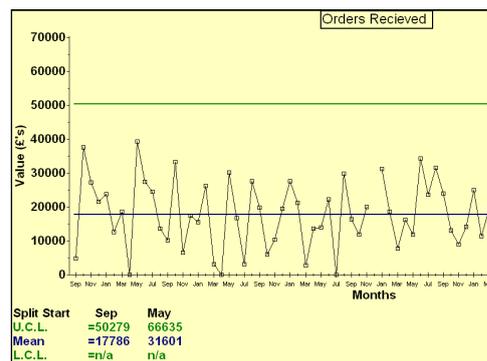


The Performance Prediction Chart® above shows accident data for a large construction company. However, similar charts can be deployed to show sales, new orders, output, stock positions, cash in the bank, profitability, debtor days, customer satisfaction and, indeed, any measure recorded over time.

Let's now look at a process common to most organisations – sales.

Learn from the past, improve the present, and realise the future¹

All too often managers make a change, get a better result for the next few periods and then declare the change to be a success, when in actual fact they have just got lucky. The graph below shows such a scenario; it shows orders received for a particular product line over a period of 5 years or so. The company had employed a number of different sales people in a number of different sales roles (telesales, direct sales, web sales etc) but the “natural variation” in the value of orders received varied between zero and just over £50k per month. The long-term monthly average was just short of £18k.



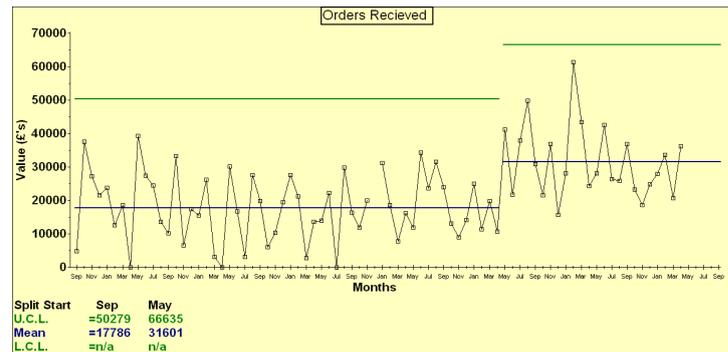
As a result of this insight, ie the fact that despite many changes nothing had actually changed (in 5 years!), an improvement team was created. It included everyone in the product team and people from other sales and support roles. The various sales processes in the business were then analysed over a 4 to 5 month period by the improvement team.

Armed with their analysis, a large number of small changes were made across the entire sales process for the particular product line. The changes included:

- 1 The quality of data employed
- 1 The way data was imported into the CRM system
- 1 The number of lists and sectors that a telesales person could work on at any one time
- 1 The prospecting emails and letters sent out to get appointments
- 1 The way in which case study data was made available to clients
- 1 The integration of the web site into the sales process
- 1 The structure of the sales visit
- 1 The way the quotations were prepared and processed
- 1 The content of the quotations
- 1 The structure of the follow up activities

The aim of the changes was to ensure the future order intake remained above the previous long running average of £18k.

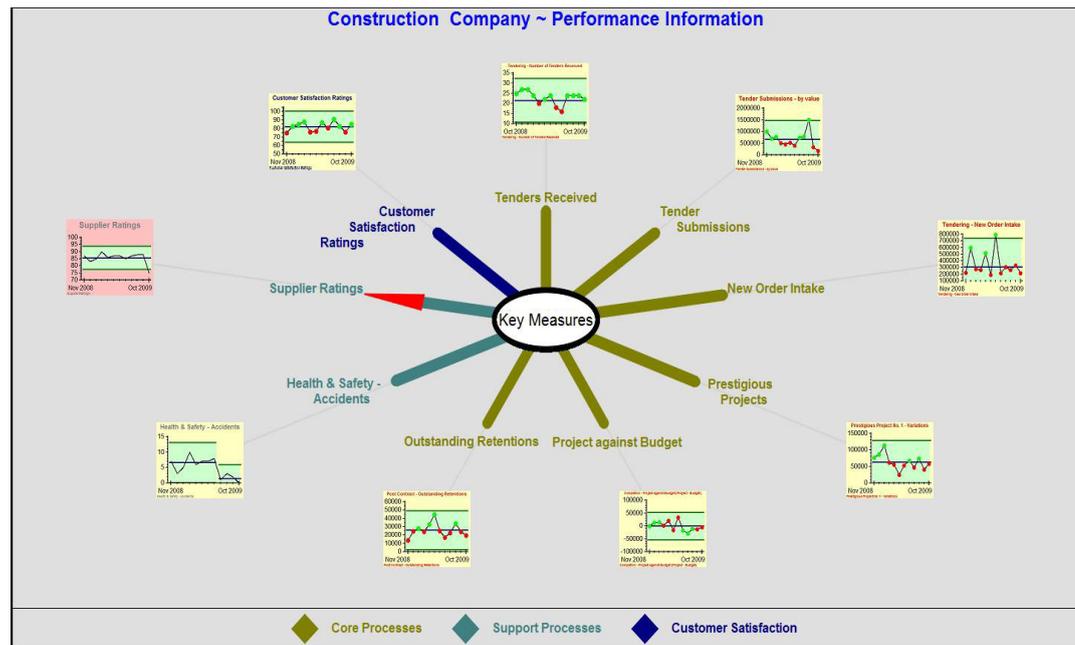
As can be seen from the updated Performance Prediction Chart® below, these changes have had a long, lasting and significant effect. For the following year, the value of orders received did indeed remain above the previous long-term average for all but one month **and** the monthly average rose to £31,601: a rise of nearly 80% on the previous average of £17,786. This is real, quantifiable, scientific and statistical improvement in sales.



The Performance Dashboard®

Obviously, different levels of managerial and operational staff will be interested in different Key Performance Indicators (KPIs) and measures and, for best effect, these KPIs will need to connect both up and down and across the organisation. As such, each role will require its own set of KPIs, and associated Performance Prediction Charts™, which can very easily be placed on a dashboard to give an overall view and from which “drill down” functionality can be employed.

The example dashboard below shows a composite Performance Dashboard® for a construction company.



The advantages of this approach are that:

- A cascade of key measures that link strategic intent to operational performance is created
- The links between strategic and operational decision making is made more robust and improved
- An early warning system for any key measure deviating from the norm is established
- The entire senior management team, and other interested parties, have a common understanding of the same shared goals
- A process for measurable, scientific and statistically robust continual improvement is developed

Having very briefly explored the relative merits of using the Performance Prediction Chart™ and the Performance Dashboard® to interpret data, the first of the following tables compares and contrasts the difference between traditional “point to point” data analysis and the analysis of “natural variation”, whilst the second table compares the practice of “analysing” data in tabular form against analysing data presented in a Performance Dashboard®.

Better decisions from better data

The following table compares and contrasts the differences between focusing on point to point data analysis and analysing variation over time.

	Focus on point to point changes	Focus on understanding variation
World view	Binary – those doing “okay” are patted on the back, those “failing” are kicked a little lower down	Continual – numbers go up and down, inside and outside the expected range of variation
The meaning of data	Meaning is attached to each and every data point	Meaning is given to the performance of the underlying process
Data signals	Each data point is potentially a signal	Signals are systematically and scientifically separated from noise
Trends	Trends are spotted when there are none and missed when they are there	Scientifically defined trends are established
Time	Data is analysed as part of the here and now	Data is used to learn from the past, improve the present and realise the future
Management approach	Manage targets, budgets and people	Act on the processes to improve the system
Culture	Data is often used to identify and blame	Data is used to learn and improve
Cause and effect	It is assumed that there are simple and direct links between cause and effect	The complex realities of cause and effect are taken into account
Focus on effort	Effort is directed at identifying the problem	Effort is focused on learning and improving the process

The following table explores the differences between the two different ways of presenting data.

	Tabulated data showing variance	Dashboard data showing variation
Viewing frame	Snapshot	“Movie” (Moving image in real-time)
Viewing focus	Current month and backward looking	Can see the past and predict the future
Decision	Reaction to single data points	Reactions are taken to real trends and exceptions
Improvement focus	Difficult to “see” improvements	Scientific assessment of improvement assured

Conclusion

Hopefully, from the above, it can be seen how the Performance Prediction Chart®, and the Performance Dashboard®, provide a more robust and scientific way of thinking about and interrogating data allowing us to learn from the past, improve the present and realise the future. In short, in using this approach, better decisions are made with better data.

References

- 1 – Private discussions with George Petri, Nomis Limited, www.nomislimited.com
- 2 – WHEELER, Don, Making Sense of Data, SPC Press, page 115

How much has this paper whetted your appetite for the effective use of data in decision making? 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.

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.

David and Goliath: Optimisation 3D™ and Six Sigma

Six Sigma has mixed reviews in the press. This paper seeks to examine the fundamental focus of Six Sigma and contrast it with the Status process, Optimisation 3D™, whose focus is to delight the customer.

Targets, goals and other management myths

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! This paper sets out a "systems thinking" alternative.

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 for the staff employed there. This paper applies systems thinking to contact centres in order to create competitive and compassionate environments.

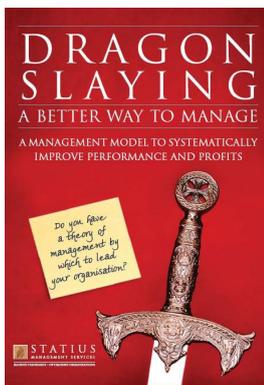
Are you the lucky one?

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.

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.

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 Better strategies;
 - o Better systems;
 - o Better measurement; and
 - o Engaged people delivering
 - o Better results

Obtain a copy from www.dragonslaying.co.uk