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Solutions first syndrome; or the easy way to avoid continual improvement

Ian Hendra

Director,

Clearline Services Ltd,

23 Argyle Grove, Trentham, 5018, New Zealand,

ian.hendra@clearlineservices.co.nz

Abstract

How do you determine an improvement opportunity? What's the difference between corrective and preventive action? What's the difference between cause and effect? What's the difference between research and innovation? What's the difference between a hazard and a risk? How do you ensure improvement actually happens? Answer…understand the problem first!

This paper will examine and question the conventional concept of root cause analysis as most of us learned it. It will question the validity and effectiveness of the approaches served up as standards even within Lean methodologies.

It will describe the often misunderstood contributions of Dr W Edwards Deming and Professor James Reason in a bid to offer an easier to grasp and more rational approach that not only effectively replaces many of the old tools but comes up with genuine answers.

And it will extend to place this methodology in the framework of a closed loop management system such as ISO 9001 and 14001, where a staff and manager driven continual improvement system is the engine without which such systems go nowhere.

A workshop will be run that will bring these tools to life….and perhaps, change your thinking for ever….

Biography

Ian Hendra is a Chartered Quality Professional and Incorporated Engineer. He runs Clearline Services Ltd in Wellington New Zealand.

With a background in medical electronics, medical imaging and radiological engineering, Ian got into supplier assessment and quality management in the early 1980s with the UK NHS Procurement Directorate in London. He joined the accredited certification industry in 1988 in the heyday of the UK National Quality Campaign and was instrumental in developing two certification bodies, one in New Zealand.

From 2001 he spent 8 years with NZ's air navigation services provider, working with the Safety Unit in an auditing and QA systems role. Since mid 2009, he provides training and consultancy in problem solving and quality systems development, hazard identification and risk management, QA systems and auditing.

He is a regular contributor to QNewZ the journal of the NZ Organisation for Quality. With a keen eye on the KISS principle and an acute awareness of Dr W Edwards Deming his mantra is "there is always a better way".

Presentation experience

Ian regularly presents to his clients and their staff. He has been a regular presenter and session chair at successive NZOQ Annual Congresses since emigrating to New Zealand in 1992. His paper entitled “Horses for courses” at the NZOQ Conference in Oct 2008, on the links between the origins and the pertinence of ISO 9001 and other QA initiatives was awarded “Best Paper “in the Productivity stream.

Solutions first syndrome; or the easy way to avoid continual improvement

Background

"There is always a better way" proclaimed the poster over Tony's office door at the scientific instruments company where I first started work in 1965. Tony was my first boss, and he expected all his staff to live and breathe his message. Frankly, it's been the cause of much frustration and anxiety over the last 40+ years because it comes up with myriad "solutions" constantly. The issue here, of course has always been "better way to do what?"

In due course, the outcome of an unfettered "better way" approach is not only solutions to problems that don't exist. More damaging are the morale sapping arguments and disagreements where the most assertive protagonists always seem to win the day over the best informed. I call the whole thing "solutions first syndrome" (SFS).

SFS is widespread as a human behaviour; all you have to do is ask a group of people an open question and note the responses. A recent local Lean initiative involved a group of companies working together to share common experiences. "Why are you here?" asked the presenter at the first session, "What problems do you think Lean will sort out for you?" Answers from those present included needing new stock control software to improve delivery performance, developing better product development processes to avoid expensive rework, and a need to change suppliers of raw material. The question about what problems these solutions were going to fix never emerged despite lengthy conversations during breaks throughout the whole six week programme. SFS is a behaviour incapable of solving real problems, trouble is we get hammered with it every time a new government takes over!

It does get worse, unfortunately, because complication kicks in to deflect and obfuscate. My pet hate here is "root cause analysis" such as that based on the conventional application Prof Kaoru Ishikawa's cause and effect diagram (1). I've never seen one of these things come up with anything other than micro-detail and guesses. The reason, it seems to me, as shown in Figure 1, is that it requires dreaming up cause areas first then attempts to fit primary and secondary "causes" accordingly. Obviously it's a system based on "solutions first".

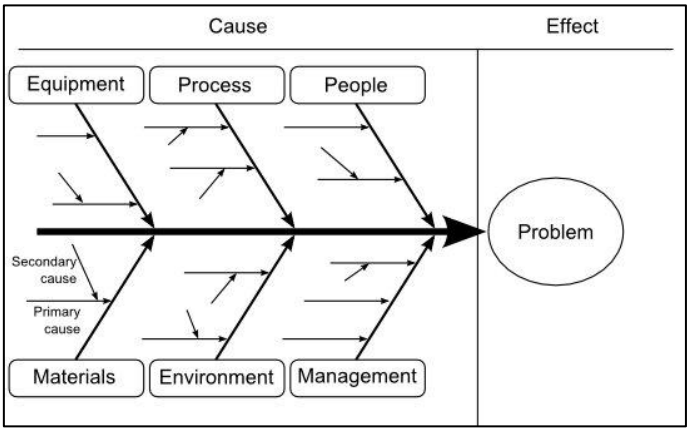

Figure 1: The conventional blank Ishikawa diagram (showing solution areas selected in advance)

Dr Deming

You can't solve a problem if you don't understand it. Or putting it in "QA speak", process improvement is not possible if the causes of variation are not fully understood.

Dr Deming called it tampering (2) and was scathing in his condemnation of it. Noting that all work is a process, the Red Bead and Funnel Experiments were the illustrations he used that showed "doing nothing" was the best option in the absence of an understanding of the factors that cause variation in the output of any process; all other options made things worse.

So the key here is developing an understanding of the improvement opportunity well enough to identify the identified problems to be fixed, but to quote Dr Deming, "By what method? Only the method counts." It's interesting that even though Ishikawa's cause and effect diagram is still touted as the tool to use among the "Seven Quality Control" tools (3), Deming does not appear to have promulgated it in his 4-day course.

Prof James Reason

Prof James Reason (4,5) from the University of Manchester is famous for his Swiss Cheese Model to describe organisational accidents such as the leak from the Three Mile Island Nuclear Power Station, the Tenerife B747 collisions, the Piper Alpha oil platform explosion and the capsizing of the Herald of Free Enterprise. His work has found favour in several high risk sectors to include aviation and medical practice.

He says organisations' structures and behaviours are like slices of Swiss cheese; he calls these layers "defences". When the holes in the structural defences align with holes in the behaviour defences something unintended (such as an accident) occurs. He calls the structural holes "latent conditions" and the behavioural ones "unsafe acts". The trick, he says is to spot these before they line up and something goes wrong.

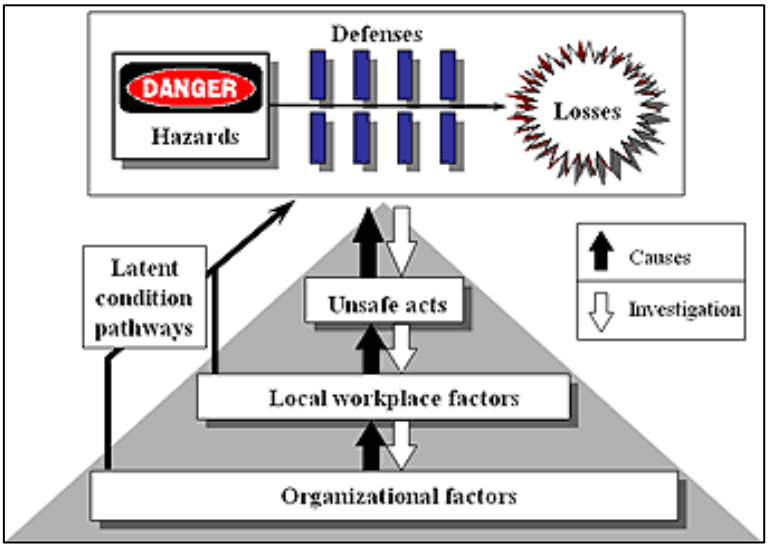

Figure 2: Prof James Reason's Swiss Cheese Model

This is much easier said than done because the location of these holes is very difficult to anticipate and in the realm of the ultimate in internal auditing. FMEA and HACCP procedures, for example, go some way but tried and tested risk management tools like these are rarely applied to whole organisational management systems.

On the other hand, finding the holes after something untoward has happened is much easier.

The problem with Reason's model, in my view, is that those who purport to adopt it have over-complicated their application to the point where the core principle has been missed at the investigation phase. Having done their so-called investigations, most are much more concerned with classifying their findings than dealing with the holes in the "defences".

Figure 1 is from Prof Reason's second book; the core message is hard to discern. The "Swiss cheese" basic principle is in the rectangle at the top, the triangle beneath obscures the simple message.

Dean Gano

Experienced safety investigator, Dean Gano (6) markets a software tool called RealityCharting based on a binary principle similar to Reason's but not related, apparently. He calls it Apollo Root Cause Analysis. He says the minimum number of causes for any occurrence is two; namely, at least one system deficiency and one erroneous action: hence the binary relationship.

Gano makes two additional vital points that add a streetwise level of reality missing from Reason's academic approach.

First, he says there's no such thing as "common sense". Since we all come from different backgrounds and have different experiences there's no basis for commonality in what we do and think. This of course is pertinent to the folly of taking seriously investigations done by individuals rather than teams.

Second, he says cause and effect are the same, it's the timing that matters. He uses an illustration like Table 1 to make the point.

Effect	Cause
Person slips over on wet floor	Leak from water pipe
Leak from water pipe	Maintenance not done
Maintenance not done	Budget run out
Budget run out	Sales targets not met
Sales targets not met	World recession
World recession	Bad mortgagor decisions
Bad mortgagor decisions	Poor governance controls
etc	Etc

Table 1: Cause and effect are the same

The binary model

If you combine Reason's Swiss cheese model and Gano's minimum of two angle, a diagram emerges as per Figure 3 that says that an improvement opportunity becomes evident when a "systemic weakness" aligns with a "precipitating action". And, since cause and effect are the same, each systemic weakness and precipitating action has its own likewise contributing factors in a binary relationship.

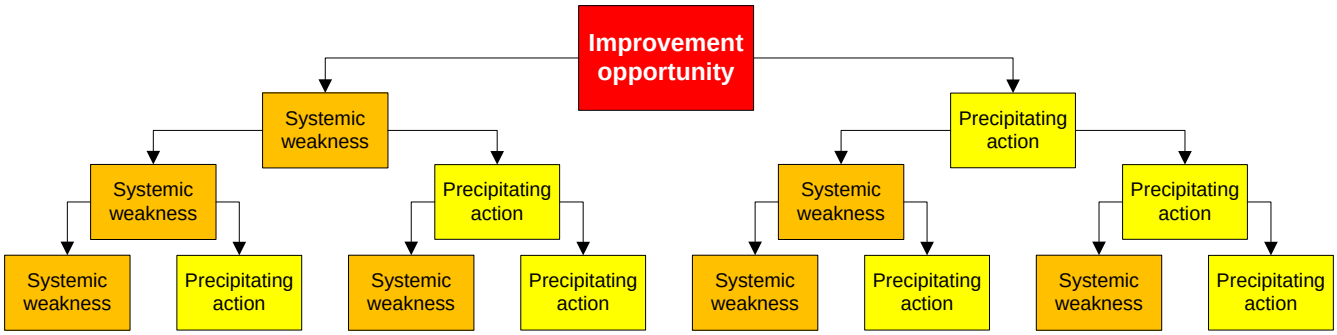

Figure 3: The binary model of problem identification

Now, the term "Improvement opportunity" is a euphemism. It means "spontaneous event", something that wasn't planned to occur.

The failure based variety would include issues, accidents, incidents, nonconformities, complaints, loss of customers and so on, but the success based counterpart would include compliments, prizes, spontaneous orders from new customers, and so on.

Making the binary model work

The other aspect often overlooked these days in the investigation of "improvement opportunities" is the use of other investigatory tools.

These would include the others that Prof Ishikawa promulgated (1) and the seven management and planning tools that emerged from Quality Function Deployment (7).

Table 2 suggests how these standard QA tools can be applied to flesh out the binary model.

Type of opportunity	Available data	Methods include… (3)	Examples
Product orientated, visible, can touch & feel it…	Reliable numerical data from measurements of process behaviour.	Run Charts, Control Charts, Histograms, Pareto diagrams…	Persistent failures in modem power supplies,
Service orientated, not tangible…	Anecdotal data	Affinity diagrams, Interrelationship digraphs, Tree Diagrams, Matrices…	Persistent late delivery of mail to rural areas,

Table 2: Use of standard QA tools to flesh out the binary model

Corrective and preventive action requirements in ISO management system standards

ISO 9001 (8) and ISO 14001 (9) are management system standards that have continual improvement as a core theme. Both have requirements that include establishing procedures for corrective and preventive action to deal with avoiding nonconformity.

Establishing the difference has been a dog's breakfast since ISO 9001 first appeared as BS5750 in 1979. Many consultants still get it wrong these days as do many certification agencies.

The fact remains that without effective continual improvement systems neither 9001 nor 14001 add any value at all. Continual improvement is the engine that powers them (10) to the point where they are both "deals of the century" when it comes to enhancing business performance.

Within those clauses is the requirement for an investigation to take place when a nonconformity arises; my observation is that this is the part that gets overlooked in the headlong rush for a quick fix that will make the issue go away.

Table 3 sets 10 open questions that can be used as an event based continual improvement procedure. The questions separate contingencies both from corrective and preventive actions, and the monitoring and documentation actions that the same clauses also require. Note that the only hint of "SFS" is in the potential inadequacy of contingency arrangements!

#	Question	Answer type
1	What fixes have been done already or need to be done to restore conformity or capitalise on the good news?	Contingency action
2	What needs to be promulgated about these fixes that others might learn from to enhance contingency plans?	Corrective action
3	What caused the event (inc failure of contingency plans)?	Problems
4	What hazards and risks do these causes expose to principal stakeholders (eg owners, customers, staff)?	
5	Where else could a similar problem occur?	
6	What action needs to be taken to treat the problems so as to prevent RECURRENCE of the same event(s)	Corrective action
7	What action needs to be taken to treat the problems so as to prevent OCCURRENCE of a similar events(s)	Preventive action
8	What documentation changes need to be made?	Documentation action
9	What actions need to be included in business plans (etc)?	Preventive action
10	What action needs to be taken to monitor the effectiveness of actions taken?	Monitoring action

Table 3: 10 questions that convert unplanned events into improvement actions

To make the link, the binary model would be used to answer questions 2, 3 and 4.

The remaining questions would be applied to the action taken to deal with the problems that emerge. Only in this way, can the full benefit of applying the requirements in the two ISO management system standards be realised with any degree of certainty that the outcome will deliver discernible improvement.

Summary and conclusions

This paper has raised the issue of Solutions First Syndrome and offers an alternative to problem solving that capitalises on having no pre-conceived ideas.

Whilst it highlights the inadequacies of the Ishikawa cause and effect diagram, any investigation process that is not completely open or suggests any particular solution in advance is doomed to give inadequate results. The binary model is easily learned, intuitive and easy to remember.

It reveals answers very quickly, but it is a team tool. It does not perform at its best when used by individual investigators, but then investigations done by an individual are always tainted by personal knowledge, awareness, habits, attitudes and behaviours. They are not effective because they do not capitalise on the whole of a team's knowledge being greater than the sum of its parts. None of us has all the knowledge; we all have some of it.

A link has been made with the pertinent procedural requirements in ISO 9001 and ISO 14001 against a backdrop where the continual improvement systems in both standards are rarely

implemented at all, or implemented so badly as to add little value. When the binary model is adopted as standard procedure within the full panoply of the management systems prescribed by these standards, the full benefits can be realised.

In conclusion, this whole area is critical for the QA profession as a whole. If we can't guide the organisations who engage us to make sure continual improvement happens "as the way we work around here" our prospects are bleak, there is little future for us.

It's not rocket science but it's not easy, either. The binary model offers a simple approach to solving problems. It fits well with the old adage partly attributable to John Ruskin "*Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skilled execution. It represents the wise choice of many alternatives."*

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