

**Continuous Improvisation:
why we are so good at it and
how it holds back improvement**

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Imagine this...

- You are a setter-operator on a press.
- You have been working on this machine for 15 years.
- It's as temperamental as your missus but you know how to keep it running.
- The only thing your supervisor ever asks about is how many parts you've made this shift
- And now you're sitting in a conference room listening to a young graduate telling you about how 5S can help you keep your workplace tidy so you can speed up your changeovers.

How would you feel?



Where did we get the wrong end of the stick?

- When did we start thinking that teaching “improvement tools” was the key to better performance?
- When did we start overlooking the accumulated skills of the operators in our plants?
- When will we start to realise that unless we lead by example, we cannot have continuous improvement?

How do you feel?



Discovering Toyota's secret

Research has uncovered that Toyota's success in continuous improvement is based on:

- Use of the scientific method
- Use of a method of teaching through questioning (labelled the Socratic approach after Socrates).
- Learning by doing (as preached by Aristotle)



Is it really the secret?

- Toyota did not tell the researchers this: they discovered it over 4 years of observation and working alongside Toyota people.
- Appears to many outsiders to be the missing link: we knew the tools and techniques Toyota used – but we didn't know how people worked to make improvement.
- Codified as the “Toyota Rules”

Articles to read:

Decoding the DNA of the Toyota Production System, Harvard Business Review Sept 1999

Learning to Lead at Toyota, Harvard Business Review May 2004



What is the scientific method in practice?

- The research says that the Toyota Production system creates “**a community of scientists**”.
- A factory full of hands-on people doing hands-on work – in a structured way.
- Work is managed by use of the “scientific method:
 - If I put this input into these conditions, I will get this output.
 - I will measure the output to see if this is the case.
 - I will measure to understand why I get any deviation.
 - I will predict the outcome of any changes I make and experiment to see if that is what I get.



Not the same as continuous improvisation!

- The scientific method is not...
 - I'll try this and see if it works...
 - If it doesn't, I'll try something else...
 - Then I'll throw everything I know at the problem in the desperate hope that something will work...
 - Getting back into production with a sigh of relief without knowing what made the difference!



A Nobel Prize for Fire-fighting?

A community of improvisers!

- Not a term you're going to see in the Harvard Business Review – but remarkable in its own way!
- We use our skill and ingenuity everyday to get round problems.
- We're driven to get round the problem by the way we are measured and what our managers pay attention to.
- Focus the system on a different outcome and you'll get a different result.



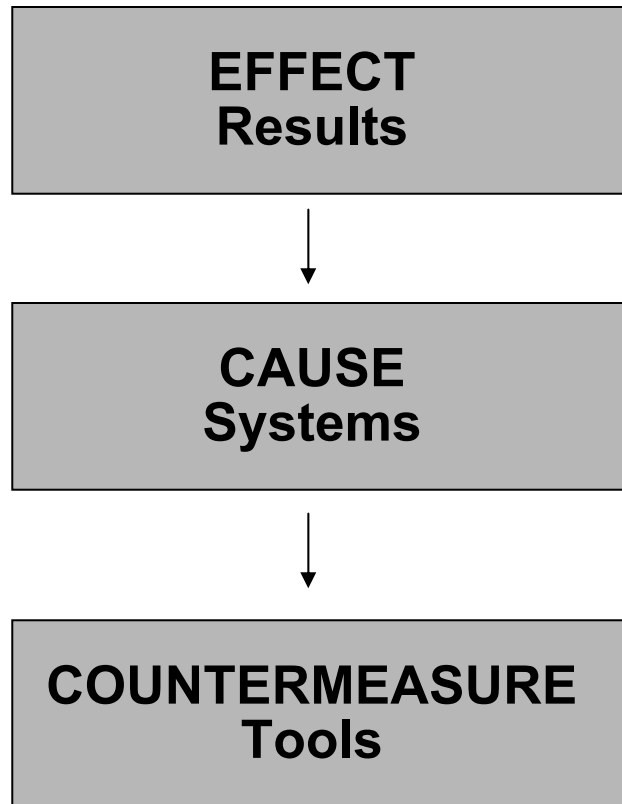
A focus on flow to the customer

- Make what the customer wants when they want it
- Keep to standard
 - Safety
 - Quality
 - Time
 - Inventory
 - People
- Understand the cause of deviation from standard

This is what the improvement tools are for.

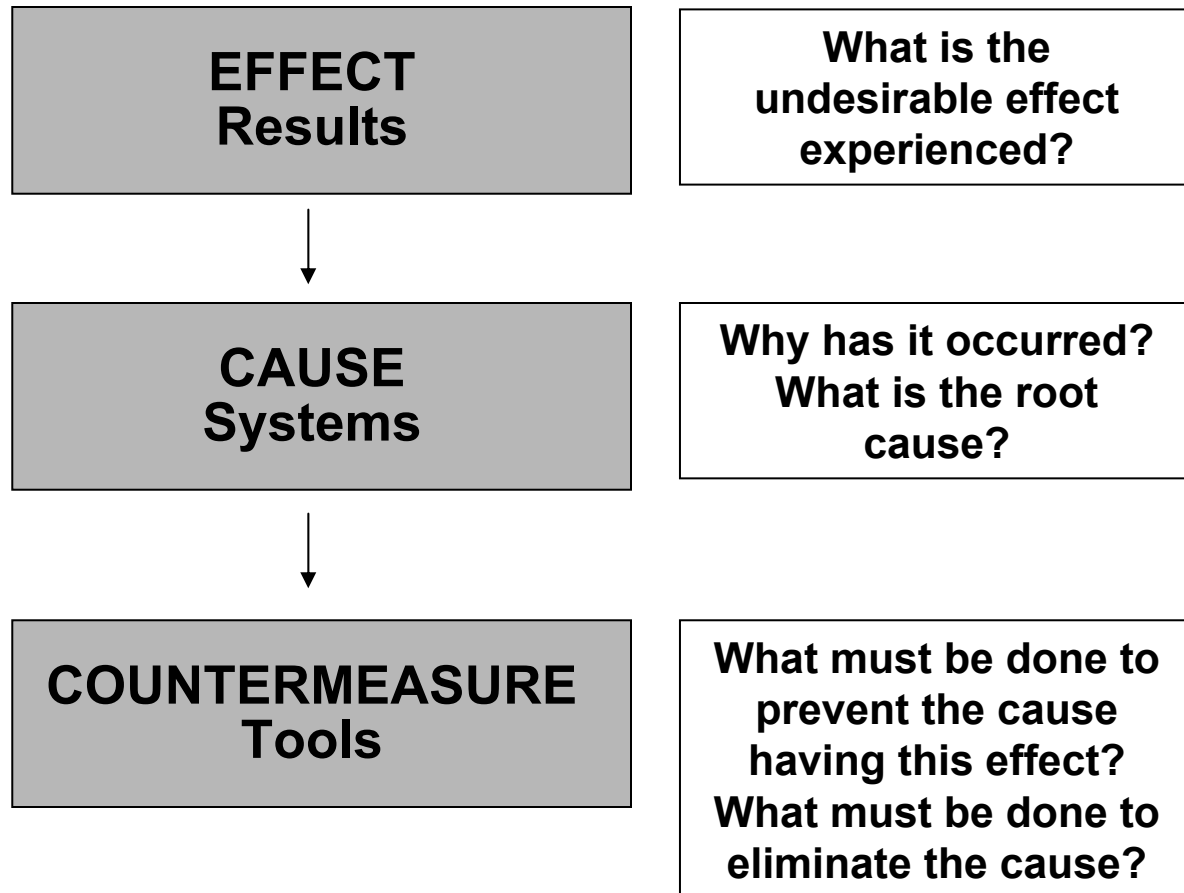


Leading Improvement



If you only ask questions about the result, you will only get short-term fixes!

Questions to lead improvement



This has never been written down at Toyota

- This was not a conscious choice.
- It emerged naturally as the company developed over 50 years.
- It is so much a natural way of working that Toyota people cannot easily articulate it: it is TACIT knowledge
- Passed on through learning by doing
- It is not visible – but the Toyota tools and techniques are so that's what outsiders have picked up on.



What are the Toyota rules?

- Toyota has developed a set of principles that allow everyone to take part in constant design, testing and improvement.
- The rules say:
 - Before you do work, make sure what you expect to happen
 - Each time you do work, see that what you expected has actually occurred.
 - When there is a difference between what actually happened and what was predicted to happen, solve the problem while the information is still fresh.



The Four Rules

- Rule 1: All work shall be highly specified as to content, sequence, timing and outcome.
- Rule 2: Every supplier-customer connection must be direct, and there must be unambiguous yes-or-no way to send requests and receive responses.
- Rule 3: The pathway for every service and product must be simple and direct.
- Rule 4: Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, and at the lowest level in the organisation.



The Rules drive out variation

These Toyota rules:

- design out variation.
- ensure that the operator knows the link between what they do and the outcome.
- mean the operator can understand the link between cause and effect.
- mean that the operator can undertake “scientific” improvement of the method.



The Socratic method: teaching by questions

- The use of iterative open questions prompts thinking and problem solving.
- NOT CLOSED QUESTIONS!!
- Why don't you do it this way instead?
- Are you sure that is the best way?
- Do you know the standard way to do this job?

- Closed questions only allow for a “Yes” or “No” answer.

- Open questions require a considered and explanatory answer.
- How ...?
- What ...?
- Why ...?
- When ...?



Questions to teach the first rule

Rule 1 is all about How People Work

Rule 1: All work shall be highly specified as to content, sequence, timing and outcome.

- How do you do this work?
- How do you know you are doing this work correctly?
- How do you know that the outcome is free of defects?
- What do you do if you have a problem?



Questions to teach the second rule

Rule 2 is about How People Connect

Rule 2: Every customer-supplier connection must be direct, and there must be unambiguous yes-or-no way to send requests and receive responses.

- No grey zones.
- How do we know exactly who should supply what to whom?
- How do we know how much is going to be supplied?
- How do we know when it is going to be supplied?
- The same for physical parts as for service or assistance.

- Connections are obvious and smooth: like passing a baton in a relay race.
- Responsibility to respond is equally obvious.
- It may be flexible to allow anyone to respond to a request for help: but when something is everyone's problem it becomes nobody's problem.



Questions to teach the third rule

Rule 3 is about How the Production Line is Constructed.

Rule 3: The pathway for every product and service must be simple and direct.

This is the FLOW rule.

- Does the product should flow one way along a specified path?
- What do we do if the product cannot flow to where it is designed to go?
How do we resolve the problem?
- What do we do if help cannot be provided by the person designated? How do we resolve the problem?
- Don't disguise the problem by allowing variation in the name of flexibility.



Questions to teach the fourth rule

Rule 4 is about How to Improve

Rule 4: Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organisation.

- Open questions to encourage the challenging of assumptions.
- What specific outcome were you expecting to achieve as a result of the changes you have made?
- Have you made the changes as you intended? Did you get the result you expected?
- If yes, why? If no, why not?

- Set a **hypothesis** and test it by experiment.
- How you make a change is as important as the result you have achieved.



Countermeasures not solutions

- Toyota does not regard any of the tools used as fundamental to their system.
- Rather they are temporary responses to specific problems.
- When the circumstances change they may be discarded in favour of something else.
- Use of the tools is nothing to do with emulating the Toyota system for continuous improvement.



Put the tools first and you'll get stuck...

- What happens if we try to use the tools in an environment where our behaviour is not coaching the scientific approach?
 - At best, the tool is seen as the solution in itself.
 - We cannot adapt the application of the tool when the circumstances change.
 - We cannot identify new places where the tool could also be used.
 - At worst, use of the tool soon dies out because no-one can see why it was needed.



Stick to the rules and the tools will follow...

- Ask questions to prompt the discovery of the right countermeasure and:
 - The link between the “tool” and the effect will be learnt
 - The consequence of not maintaining the countermeasure will be understood and avoided.
 - This learning can be drawn on to adapt the countermeasure to different situations.
 - The learning can be passed on to others.



Teaching by doing

- Managers and supervisors become capable of teaching these skills to their teams in a learning-by-doing fashion because this is how they learnt.
- To develop the skills in others we “teach by doing”.
- To teach others, we have to develop the skills ourselves: we “learn by doing”.



Questions to lead improvement

