CONTINUOUS PROCESS IMPROVEMENT USING TOC

One of the most important aspects of any organisational improvement programme is the recognition that there are two distinct constructs, the practical applications environment and the leadership and relationships environment. If we are serious about developing our organisation to maximise the potential that resides within, to close the gap between current performance and desired performance, then we must always bear in mind these two constructs and never allow ourselves to focus only on one to the detriment of the other.

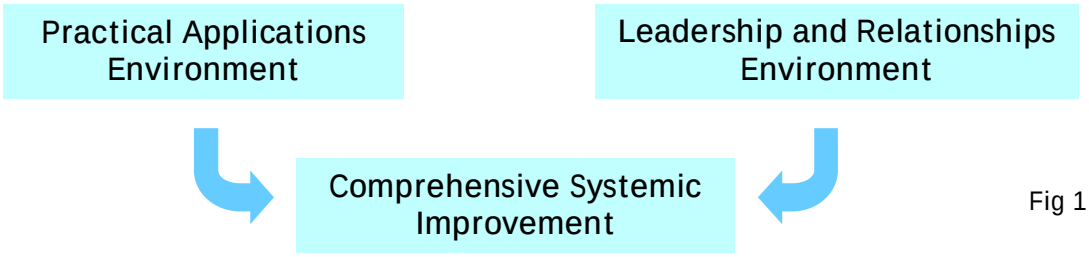

Fig 1

Therefore achieving such Continuous Process Improvement (CPI) demands a thorough understanding of the problems and issues within both the practical and leadership environments.

- **The Practical environment is defined as the place where flow happens, the shop floor, the office, the ward, indeed any location where flow can be seen passing through a number of dependent resources and it can be material, people or perhaps information.**
- **The Leadership environment is defined as the area of policies, measures and behaviours, where flow is not visible, where the organisational culture has a dominant impact, where perception and reality can become one. This is the area of organisational behaviour, of relationships throughout the organisation and the impact the measures have upon the way people respond to their daily work.**

The tools to address issues in one environment are not the same as in the other, but most organisations need to have people who can address issues in both. This has led to the development of what we call the CPI Learning Engine. It drives the improvement process from beginning to end and includes not just the core of TOC tools and techniques but those of Lean and DMAIC as well, a true fusion of these powerful methodologies.

The Practical Environment

This is where the full power of the Five Focusing Steps is applied:

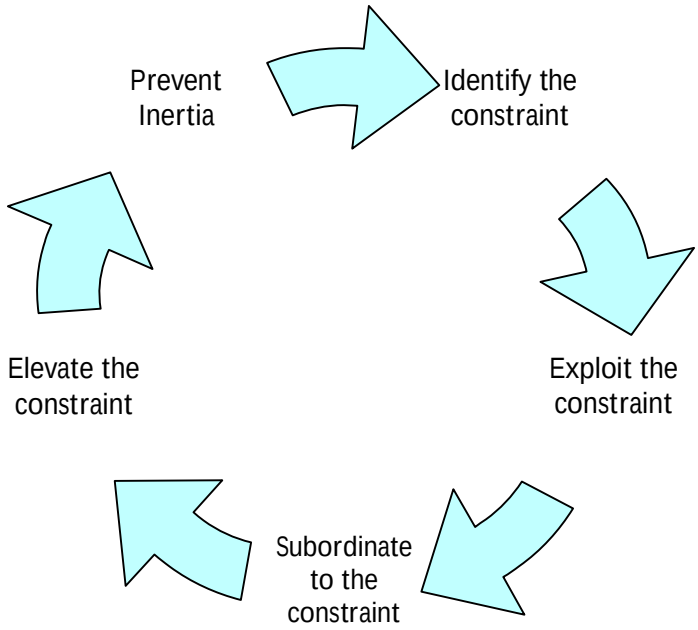

Fig 2

The impact of using these steps has been recognised over many years in applications such as Drum – Buffer – Rope and Critical Chain, and the places where these tools have been used are

both wide and varied. We ourselves have implemented the Practical tools in manufacturing companies, the rail and construction industry, the health sector and many more, but there is a limit to the real bottom-line impact that the practical tools can have; they are best used in combination with the tools from the leadership/relationship environment.

The Practical environment applications therefore cover the following:

- **Operations – all types**
- **Project Management and Engineering – all types**
- **Finance and Measurements**
- **Supply Chain – internal and external**
- **Sales and Marketing**

The Leadership Environment

This is where the Thinking Process tools are applied. Their full power is necessary if we are to successfully implement many of the practical applications. These tools also work at two levels, the overall issues and problems within the organisation as a whole and also at the level of the team and individual. An overview is shown below:

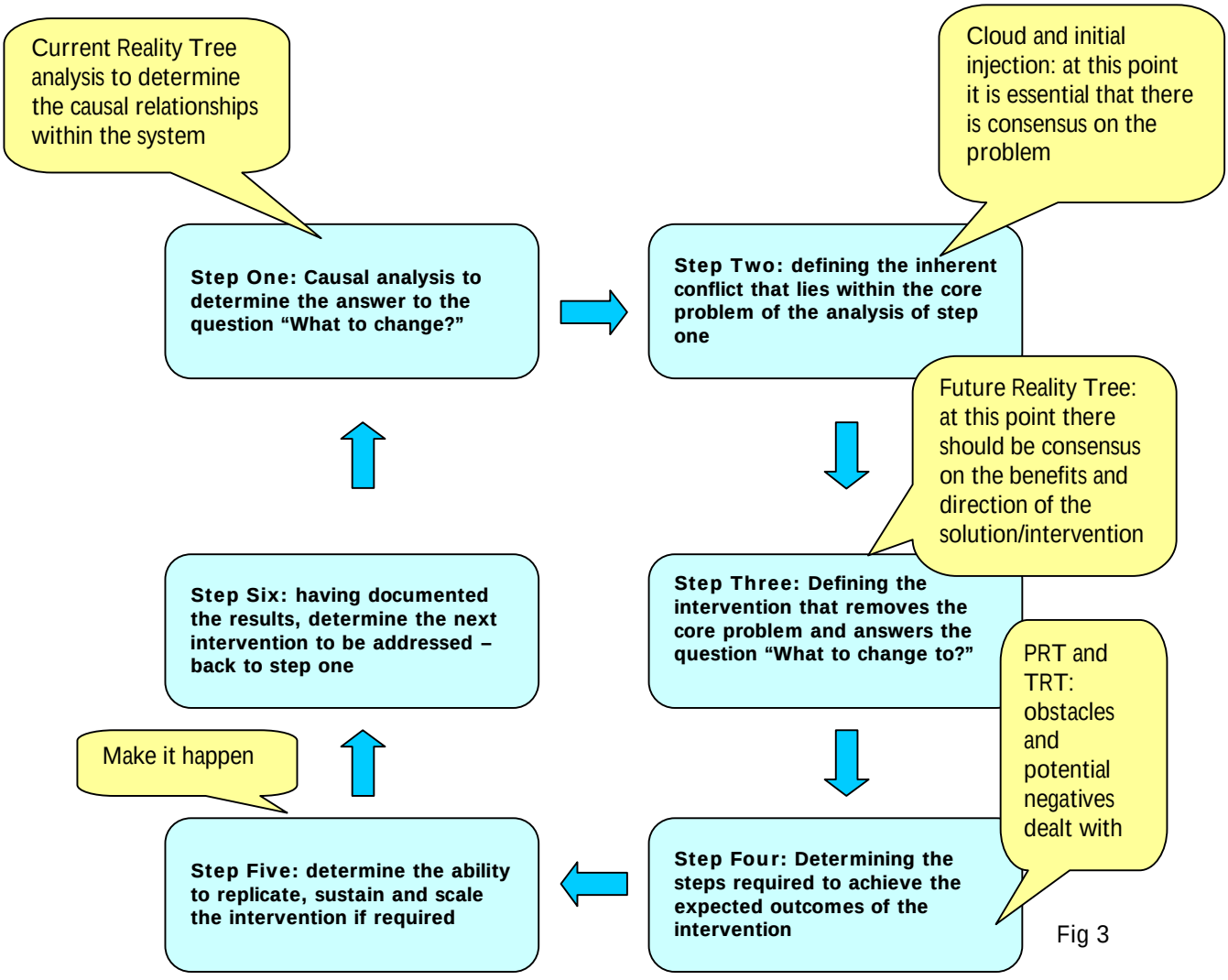

Fig 3

The Pre-Requisite Tree (PRT) and the Transition Tree (TRT) are core components of the Thinking Process tools as are the Current Reality Tree (CRT) and Future Reality Tree (FRT) logic analyses.

The Leadership environment covers the following areas of analysis:

- **Global Interventions - defined in the following way:**
  - **Determined by the buffer management system and affecting the measurements of one of two distinct parameters**
  - **The Goal of the organisation and/or**
  - **The necessary conditions to the achievement of the goal**
  - **Led by the senior team**

- Local Interventions - defined in the following way:
  - Determined by the local teams as affecting flow but not necessarily affecting the global measures of the system
  - Led by the local team
- Team Dynamics
  - Developing the skills of the team in terms of conflict resolution, risk assessment, team development etc
- Strategy Development

So if we are to transfer the knowledge contained within both the practical and the leadership, how is this best done? That is where the learning engine idea comes in.

The Learning Engine

Underpinning Knowledge Level One (UPK 1)

This is the starting point for the learning engine, where the fundamentals of systems thinking are introduced, giving the ability to understand and map flow in simple terms and carry out basic system analysis. This level forms the foundation of what is to follow. At the end of the training input, at this level, people have begun to understand simple systems ideas and just what is meant by interdependence within systems. This will have major implications further on in the learning.

When people go through the training they will address at least one current issue within the organisation which requires attention. They start to develop the basic skills of systems thinking and how the CPI/TOC tools and techniques can be used to achieve breakthrough solutions, even at this foundational level.

The basic structure is shown below:

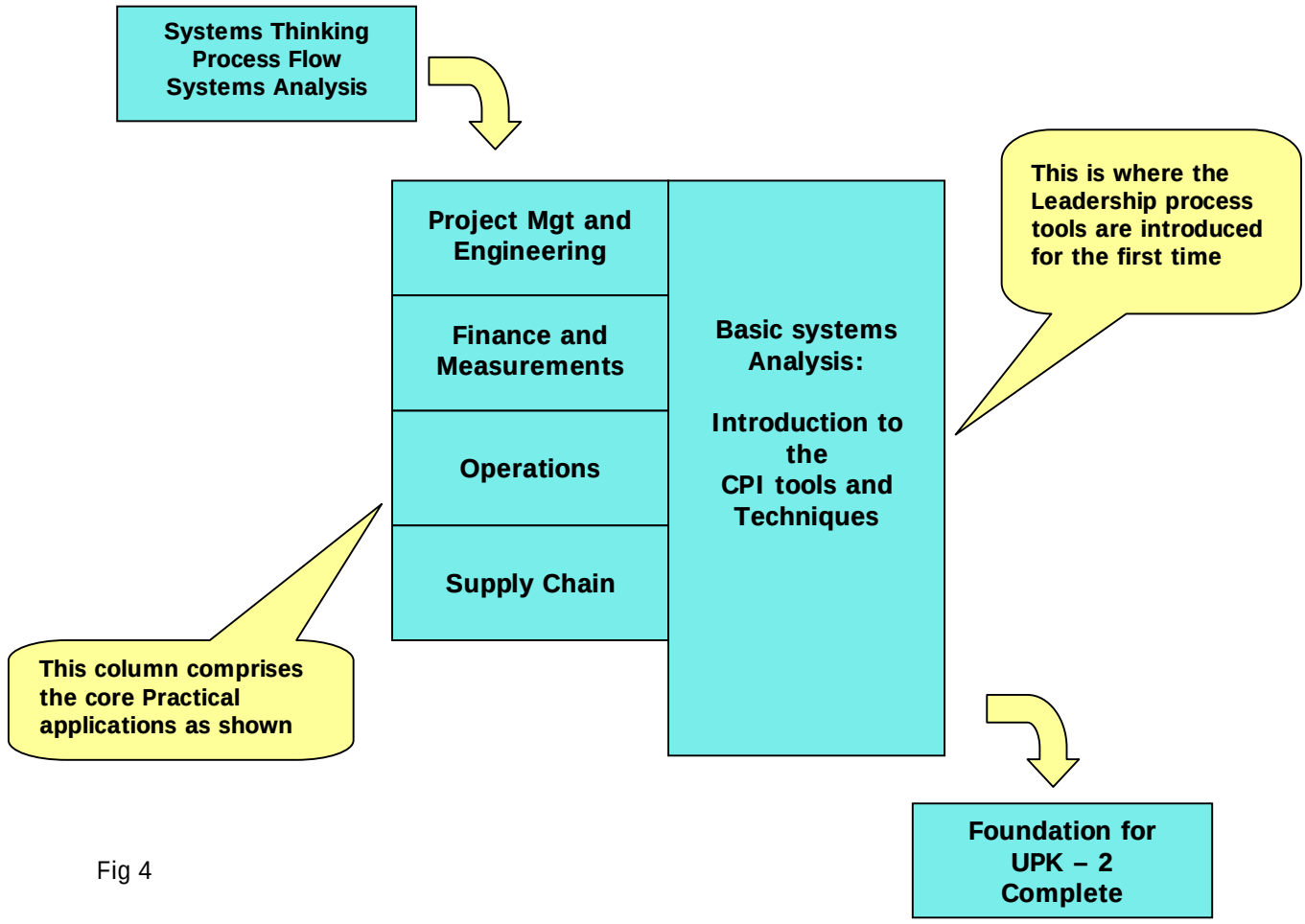

Fig 4

Once the training under the banner of UPK – 1 has been completed it is possible to move forward to that of UnderPinning Knowledge Level 2 which is defined as the level where those having completed the training are able to implement the relevant application into their own organisation. The point at which the individual is considered ready to move to the next level is

the successful implementation of a simple intervention within the organisation and their demonstration of competence in the practical applications as well as a basic understanding of the leadership tools.

Underpinning Knowledge Level Two (UPK 2)

At this level we now dig deeper into the knowledge contained within both the practical applications and the leadership/relationship thinking processes. At this point the individual might well be focusing on just one or two of the practical applications in addition to the logical thinking process tools. The full range is shown below:

- **Operations and Replenishment (Practical) – this is where both internal and external supply chain issues are dealt with.**
- **Project/Programme Management and Engineering (Practical)**
- **Finance and Measurements (Practical)**
- **Sales and Marketing (Practical)**
- **Change Management Thinking Processes (Leadership & Relationship)**

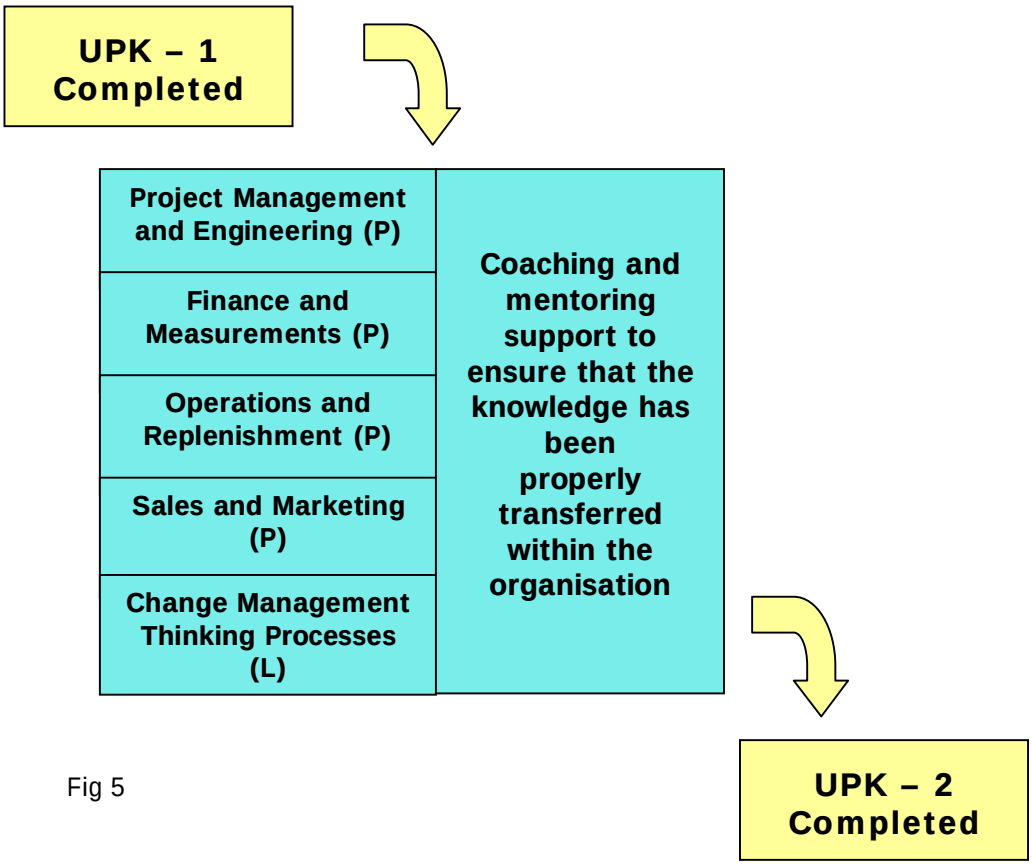

Fig 5

Once this level has been completed the next step would involve the individual working their way through the Application Expert training programme which enables them to teach and implement the relevant application from both the practical and leadership arenas. Finally there is the level of Implementation Expert where the person is able to lead any key intervention activity within the organisation and is able to develop new applications and then roll them out to the organisation as required.

These people now have the systems skills that we set out to achieve at the start: they can use the core Lean and DMAIC tools, they have a deep understanding of the TOC/CPI toolset and have become people who can drive change in the right direction, with results straight to the bottom-line. They also understand the learning engine and can replicate it, sustain it and scale it within any organisation, which is part of our goal: to transfer the knowledge of continuous process improvement to people who know they need to change.

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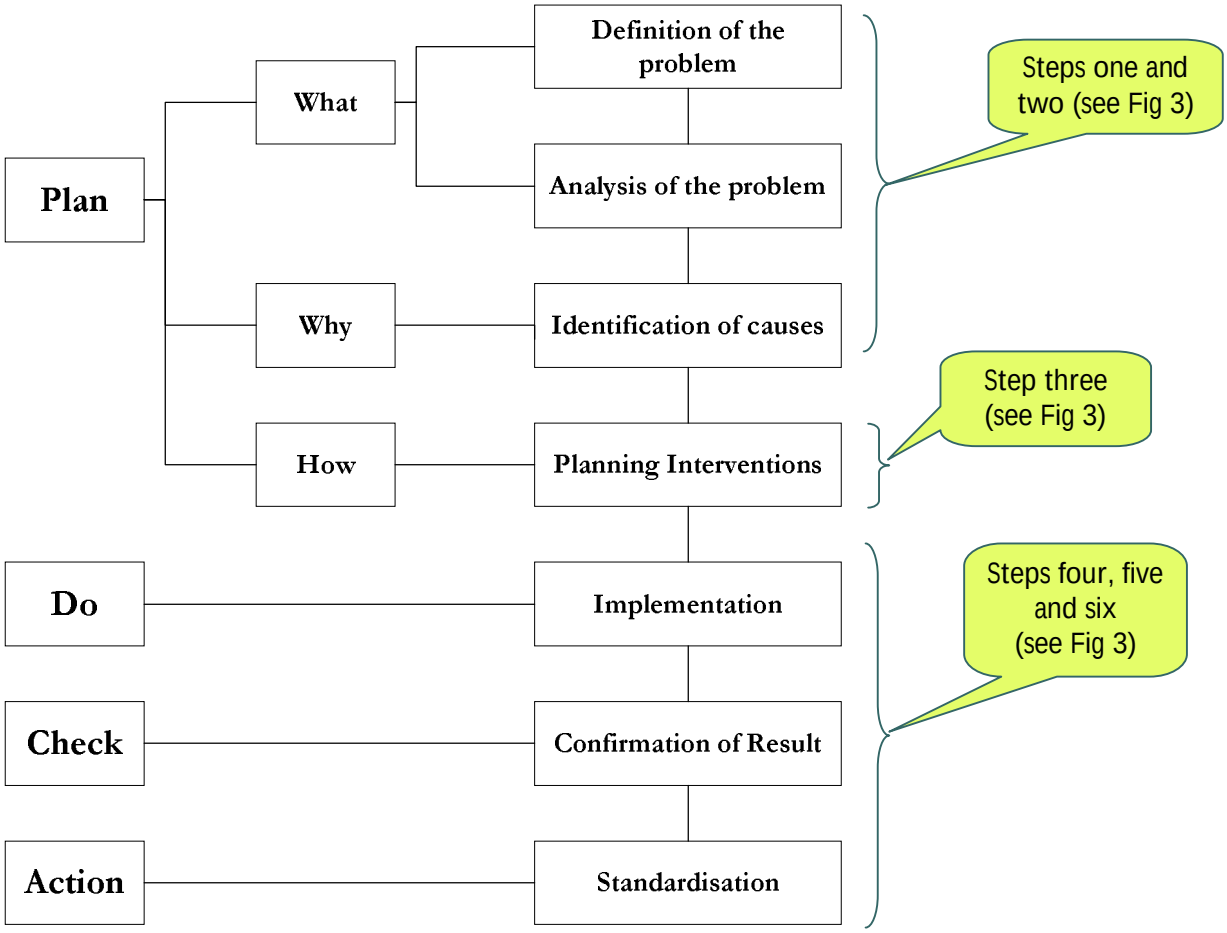
Mapping the Leadership Tools to the Deming Approach



This shows how simple it is to take the standard Deming approach of Plan – Do – Check – Act and relate it to that of the CPI/TOC leadership process tools as denoted in the six steps (see Fig 3). The next step is to make the whole thing very visible to everyone in the organisation, which leads naturally to the use of A3 story boards.

Using A3 Story Boards for a TOC/CPI analysis linked to the Deming approach

Why do we use Story Boards for CPI analysis?

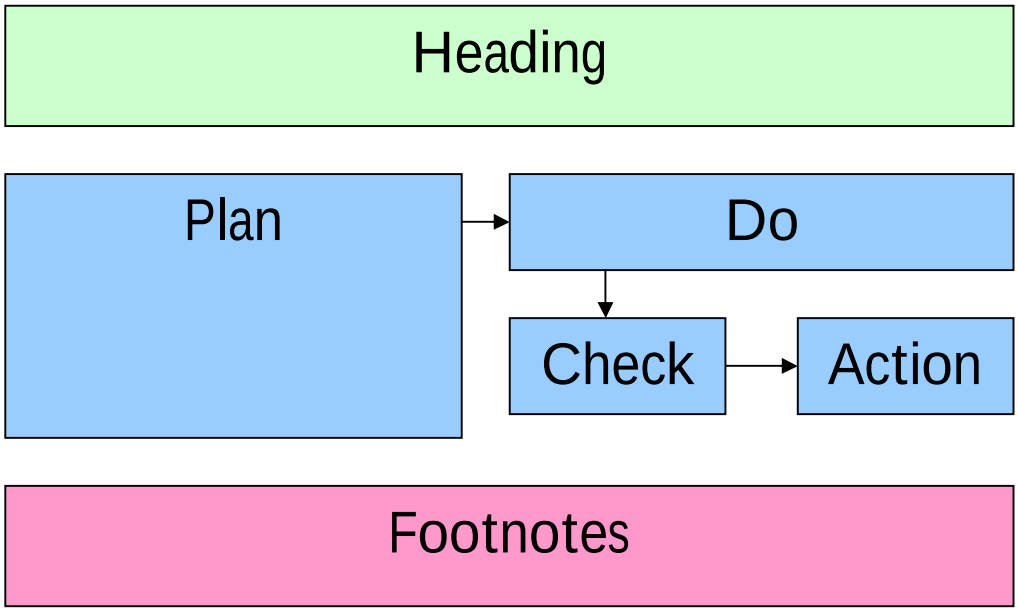
We have found that there is a real need for visual controls for continuous process improvement; this reflects the need for the clear and simple analysis tools contained within the CPI learning engine to stand out.

We have also found that this enhances the link between the Deming, Lean and CPI techniques into one systemic process. Finally they aid clarity for the whole team, helping them to see what their contributions to the overall flow within the system must be. The story boards should appear on the company notice boards, placed where all the workforce can see them and thus understand what is being done in terms of overall system improvement. They need to be adjusted for the type of story:

- **Global or Local**
- **What has driven the need for the intervention project?**

We have found that when they follow the usual steps of the Deming Cycle coupled with the CPI process tools, as shown above they have the greatest impact. However there is no exact or specific look or format. They are simply highly visual, with lots of pictures, charts, drawings etc and always on one page of A3 paper. Finally they must flow as a story – a graphical story teller.

The basic structure is as follows:



Heading

This is the focal point of the story, so what is this story about? What is the scope of the intervention and why is it being considered? Which area within the organisation, or does it cross a number of boundaries within the organisation and perhaps beyond?
Who are the key people involved, the stakeholders? Who is leading the intervention?
What is the time frame of both the problems and the intervention itself?

Plan

This starts with a determination of the key driver for the analysis – global or local. Once that has been determined the next step is to capture the problems/issues/UDEs (Undesirable Effects) that demand attention. For example, what is being put at risk with the continued existence of these issues, and what measurements are being violated, both financial and non-financial? This includes an analysis of the situation using the range of CPI Leadership tools such as Clouds and CRT (cause and effect) through to the full development of both the solution and the implementation plan. It might also be appropriate to use other tools from the Lean toolset such as 5 Whys etc plus charts drawn from SPC, process flow mapping and other sources in order to gain a really clear picture of the environment of the problem. Once this has been done the next step is to check the analysis and the ability of the organisation to successfully implement the proposed solution, addressing issues of change, including setting the target, the objective of the proposed solution including measurements.

Do

This is where the solution is implemented. Measurements are taken to ensure progress towards the objective of the intervention project. It is where we check that the action plans for the key people have been published and agreed. The next step is to ensure that the project plan has been properly developed, and that people, resources and time have been allocated and transferred into a CCPM project. It is during the implementation process that the steps being taken are documented for future analysis if required.

Check

This is the simplest bit – were the expected results achieved, and if not, why not?

Action

This is the final step where adjustments are made if the expected results have not been fully achieved. This is followed by an analysis of why the expected results were not achieved and the reasons captured and documented. Of course if the solution is OK then the following questions can be asked:-

- **Is it replicable?**
- **Does it need to be rolled out?**

- **Is it scalable?**
- **Is it sustainable?**

The last step is to move to the next project on the list.

Footnotes

This is where we capture when the intervention was completed. Any review that has been carried out is also documented and available for further review if required. If such a review has been carried out then questions such as - who did it, has the project now been signed off and what were the additional actions required to secure the objectives - are answered.

TOC-Lean Institute
22, Digby Drive
Melton Mowbray
Leicestershire
LE13 0RQ

Tel: 01664 502860
Fax: 01664 502870

www.toc-lean.com
www.constraintmanagement.co.uk

If you would like further information or wish to arrange a course at a time to suit you and your organisation, please contact us by telephone or email:

Ted Hutchin
tedh@toc-lean.com

Diane Jeary
dianej@toc-lean.com