

Value Stream Mapping

As organisations come under increasing pressure to deliver value to customers and to decrease costs, the inevitable questions eventually emerge:-

- What parts of our processes add value from our customers' perspectives?
- What parts of our processes add cost?

To these first questions come subsequent supplementary questions:-

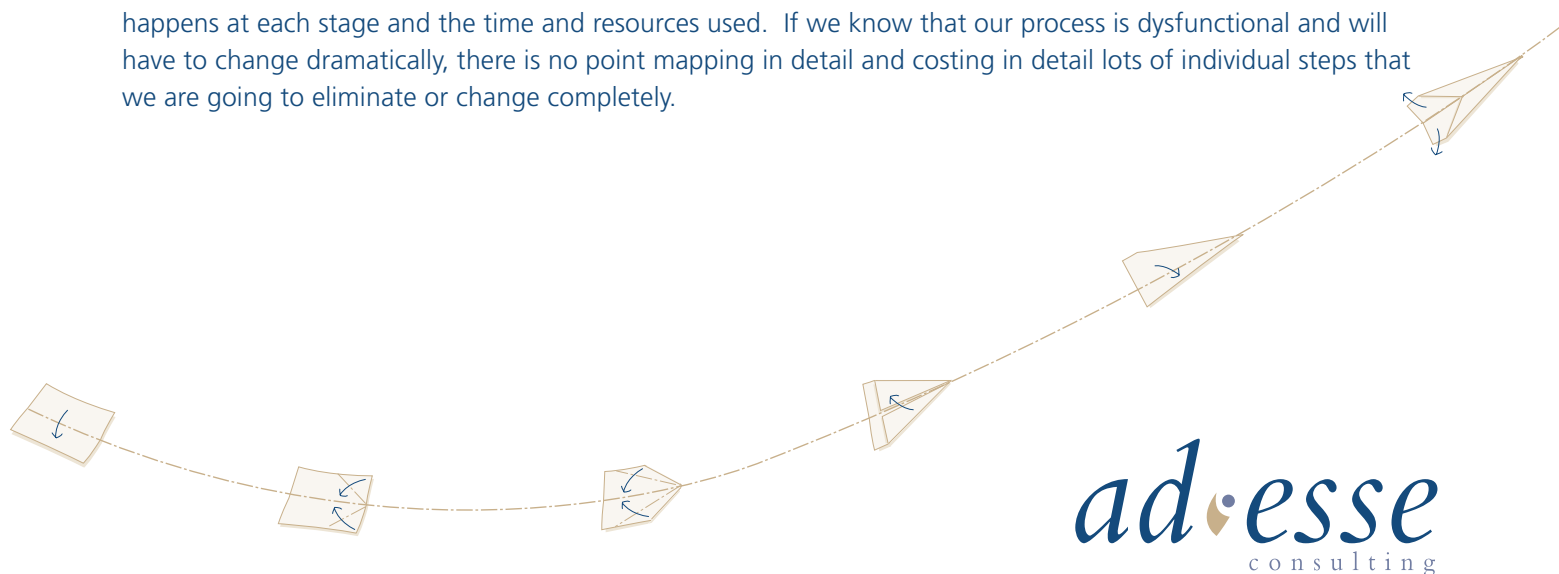
- What parts of our processes are unreliable and create variation?
- What parts of our processes limit our capacity?
- What parts of our processes reduce our flexibility?
- What parts of our processes do we need to change to reduce our cycle times?

At some stage in any improvement process – and hopefully near the beginning – we realise that to answer the above questions, we need to understand what goes on in our processes. This should lead us to process mapping. Mapping a process can be done in over a dozen different ways.

As an example, we can draw a picture of the area where the process takes place and then overlay the steps of the process to show the physical movement of the item being processed. This will show us how an improvement in the layout of the physical working environment can improve the process.

Or, we can map in a data-table the time that each step in the process takes, together with the average waiting time for an item between each step. This will show us the average activity time and waiting time and so enable us to understand and reduce the overall cycle time of the process.

The point is that we need to understand what we are trying to achieve with our process improvement activity before we go off and map the process. If we need to cost a process, we need detailed understanding of what happens at each stage and the time and resources used. If we know that our process is dysfunctional and will have to change dramatically, there is no point mapping in detail and costing in detail lots of individual steps that we are going to eliminate or change completely.



Rather than turning this article into a mini-toolkit guide, we shall focus on value stream mapping in more detail. Information on other mapping tools, and indeed other Lean tools, can be found in many books such as 'The New Lean Toolbox' by John Bicheno. This is a handy book to have to hand as it explains over a hundred different techniques that can be used during a Lean project.

WHY USE VALUE STREAM MAPPING

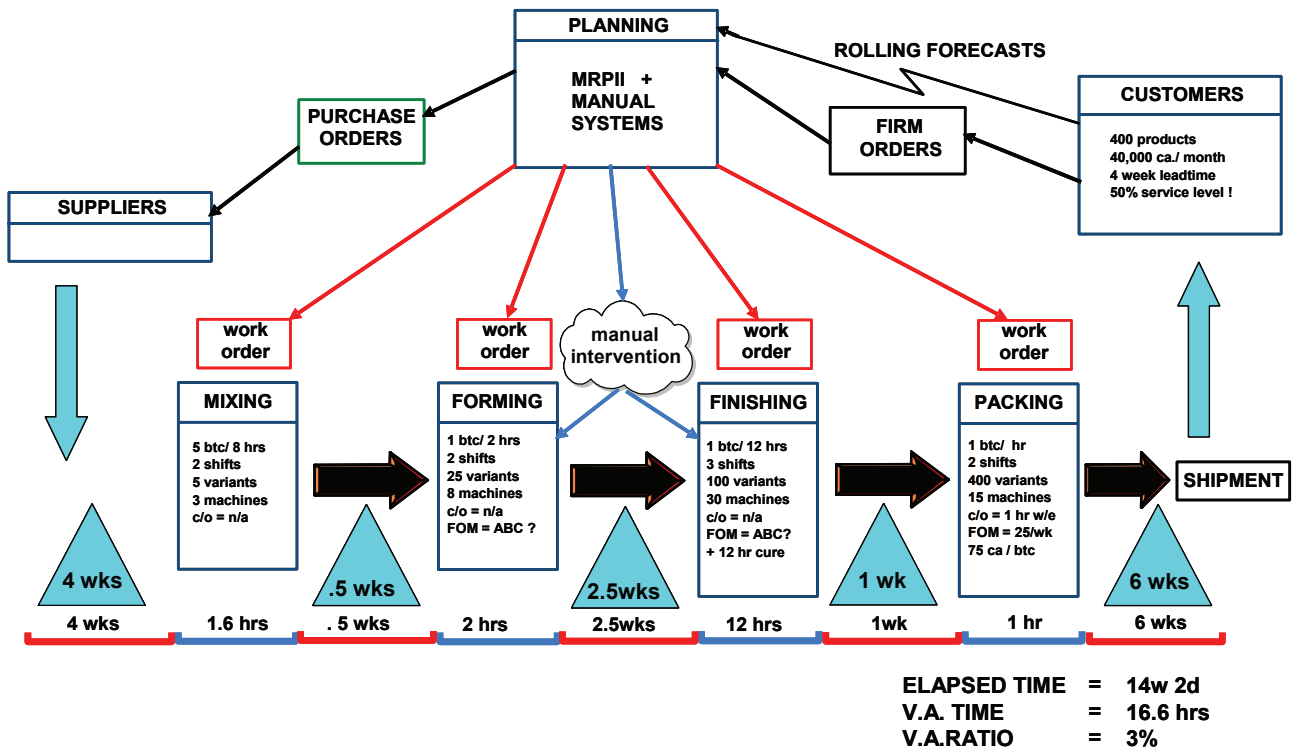
When implementing Lean, a tool frequently used is value stream mapping. The purpose of a value stream map is to look at the flow of a key process from start to finish. The start is usually the creation or receipt of a customer need and the end is usually the provision of the product or service to the customer. The value stream map shows both the flow of the physical product being processed and the flow of information governing the ordering, scheduling and production of the item.

Value stream maps are usually produced for the process of a whole group, or family, of products or services at the same time. For example, the flow of all the cases in a case management process or all the caravans of different type going down a caravan production line.

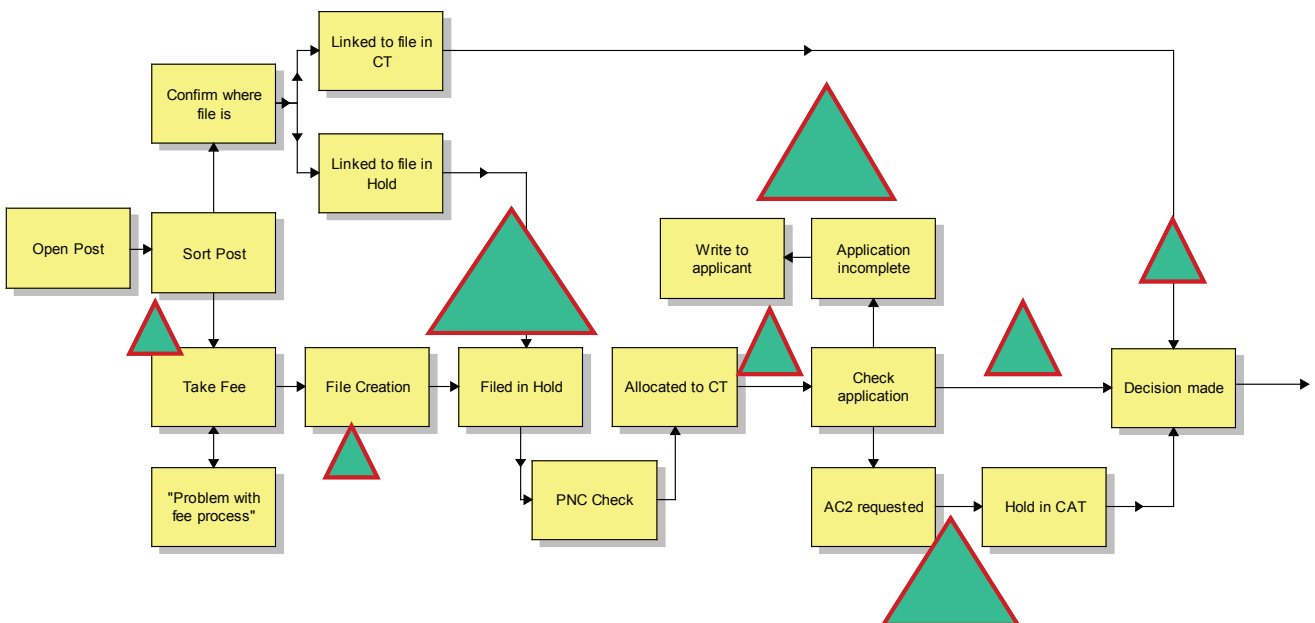
The usual aim of producing a value stream map is not just to understand one process (e.g. how a new case is opened up on a computer system), but to look at the whole end to end process. It is not just process mapping, but an attempt to understand the whole flow of the process with a view to understanding how the process parameters can be changed to achieve the type of improvement we are interested in. Value stream mapping is integral to process improvement. It reduces the risk of one stage in a process being improved to the detriment of another stage. The map is used as the basis for planning one or more improvement events with a view to transforming the process over time.

Before we discuss how to produce and use a value stream map, it is worth saying that the map itself can be as detailed or approximate as required. Some maps will need to be precisely balanced with the utilisation of resource calculated extremely carefully. Others can approximate much of the detail, but will still contain enough information about the flow of the items through the process to identify the problems and potential improvements.

The following shows a detailed value stream map for a fairly simple production process. It shows the flow of information and the flow of the product. It shows the customer demand for the product and the different variations of product covered in the map. It shows the hours that each stage in the process is available for and how long the step that we are interested in takes. It looks at resource available at each step and the resource used by one individual item. It also shows the stock or work in progress (the triangles) between each stage. It shows how people in the process are told what to do (electronic data and manual intervention) and whether product is pushed or pulled through the process (in this case the arrows show that materials are pushed through every step). The final piece of information on the map is the cycle time taken for one item to move through the process. The map is highly detailed and extremely useful for the expert practitioner, but perhaps a bit data-heavy for anyone else.



The second value stream map was used to communicate with staff and managers the reasons why a process had to change and how. It does not include most of the detail shown above, but shows the main process steps and the work in progress associated with it. It also shows how the process improvement is broken up into a number of distinct blitzes. This was enough information for most people and made the map much easier to understand and digest.



HOW TO USE VALUE STREAM MAPPING

The process for producing a value stream map is:

- Plan the activity,
- Walk the process and collect the process and step data,
- Produce and analyse the current-state value stream map,
- Produce a future-state map,
- Develop a change plan,
- Implement the changes,
- Review the process and repeat.

PLANNING THE PROCESS

The aim of a value stream map is to show the whole process for a family of items. Therefore, it should start as early as possible in the process and finish as near to the end as possible. Depending upon the process chosen, this may involve mapping the process at suppliers, customers or other parts of the organisation. The buy-in of these third parties has to be gained. If it cannot be, there is no point mapping what goes on in those stages.

At this stage, the aims of the improvement activity and its scope have to be agreed between the improvement team and the organisation's senior management. The team that will carry out the mapping has to be agreed. A process has to be mapped by the people who operate it, together with some expert input to assist with the mapping and to challenge why things are done the way they are done.

Walking the process and collecting the process and step data

The aim of this stage is to collect all the data needed about the individual process steps and the overall process flow. We need to capture this in such a way that the data collection does not slow the walk-through too much. We can always come back for specific data after the initial visit.

The consensus for mapping seems to be that using A4 or A3 paper, together with pencils and coloured highlighters give the right mix of flexibility and visual impact. My personal preference is to start at the beginning of the process and work downstream. Others swear by the advantages of starting at the end of the process and working upstream. Either way, it is essential that those involved in the mapping know the area and know where the metaphorical 'bodies' are buried. There is no point mapping what should happen. What we want to know is what does happen – however unpalatable this may be to senior management (or the customer).

The initial walk-through is likely to be followed by a couple of subsequent visits to collect specific data on timings, delays and to build up a picture of what is average performance for the process.

PRODUCING AND ANALYSING THE CURRENT STATE MAP

The current state map is a fancy way of saying 'what happens now' or the 'as-is' process. The current state map should show all the process steps and sufficient detail on how each step is completed and what happens to the items being processed. This will enable us to spot the causes of problems and thus the means to improving the flow, efficiency, reliability and flexibility of the process. It can be as detailed or as simple as you need and can also exist in a number of different versions for consumption by different internal or external groups.

The analysis of the map consists of identifying the various ways in which the Lean principles can be applied. These are likely to include:

- Moving from a push to a pull process,
- Reducing batching,
- Balancing the capacity of the different stages of the process,
- Eliminating non value-adding steps,
- Moving decision points to earlier in the process,
- Simplifying individual steps,
- Reducing the cycle times or changeover times of individual steps,
- Improving the flow of information between steps.

As well as other specific improvement activities.

PRODUCING THE FUTURE STATE MAP

When all the possible improvements have been identified and considered, the next stage is to develop a single, future state map to show how we want the process to operate in the future. How far away this future is can vary, but we would normally work to a 3-6 month horizon, on the assumption that the future state process will be arrived at after a number of sequential blitz events. The new process is tested against the Lean principles and any waste or flow issues are identified and removed. When we are convinced that we have a process that is as good as it can be we draw up the future state map to enable us to explain the new process to others.

Experience shows that most future state maps will need to be explained. Lean is simple, but it is not always obvious. Even people who are painfully aware of the inadequacies of their own processes can be reluctant to substantially change how they operate. Most people feel more comfortable with the small-scale change rather than large-scale redesign.

DEVELOPING THE CHANGE PLAN

The aim of this stage is to develop a plan that takes us from the current state to the future state in a sequence of discrete actions that make the process better each time. Sometimes we know how we want to change the process, but the act of making one change without the others already in place can cause problems to occur. We must develop our change process so that each step can function independently of those to come after. In a Lean transformation it often makes sense to start a series of improvement workshops at the start and then work down the process. However, if one step creates limits in capacity or is the cause of large delays it may make sense to start with that step.

There is no simple guide to the sequencing of improvement actions. Experience and a good understanding of Lean, processes and change management are required.

IMPLEMENTING THE CHANGES

Once we have a plan, all that is left is to implement it! The normal process for going from current state to future state is by using kaizen blitzes. These are usually week-long workshops, involving teams made up of staff and managers from the process we are tackling. They work through the current state map and usually add some detail to the map and list of problems. They identify their objectives for the blitz (based on the future state map) and then go about the implementation of the change. Blitzes are fascinating, uplifting events. Most people come into them cynical and suspicious and emerge empowered and enthusiastic. Very few blitzes fail, particularly if they have been well planned in advance.

Over the period of a couple of months, a series of blitzes is run to gradually tackle all the stages in the process and develop the changes necessary to move to the future state.

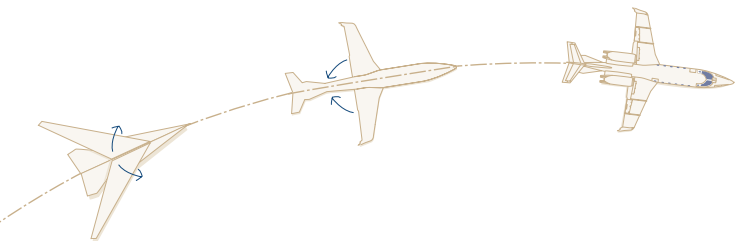
REVIEWING THE PROCESS

Once a process has bedded-in, it is worth reviewing the new process with the people who took part in the value stream mapping and those who participated in the blitzes. There are always some small items to address and some new ideas to incorporate in our future state map. What went well and went badly with the change process need to be recognized and lessons learned. Measures need to be tracked and a means of developing future improvements needs to be built-in to the day-to-day running of the organisation.

Once this future state map is fully implemented, another key process or product family can be mapped and tackled in the same way. Customer and stakeholder requirements are constantly evolving, so it should be regarded as normal that processes should change in the same way. Having an up to date current state map means that changes to requirements can be directly read across to changes in process. Having a number of future state maps up your sleeve can save valuable time in delivering the changes necessary.

If you want a good book on value stream mapping then 'Learning to See' by Mike Rother and John Shook is an excellent guide to producing current and future state maps. Although it is clearly focused on production processes, the techniques can be applied to any service or administrative function.

For more information about value stream mapping please contact Philippe Lacey, Director, Ad Esse Consulting.



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