What is Lean Thinking?

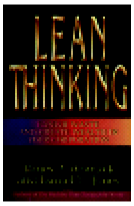
Professor Peter Hines & Andrew Stewart*

This is the first in a series of articles over the coming months that will explore what Lean Thinking is, the boundaries of the approach and how it can be successfully applied inside a company and its wider supply chain. This first article is designed to prove the reader who is new to this topic with a brief introduction to what Lean Thinking is about.

The Lean Vision, Principles & Lean Profit Potential

The characteristics of the lean organisation and the lean supply chain are described clearly in the book Lean Thinking – Banish Waste and Create Wealth in Your Corporation by Jim Womack and Dan Jones. This book provides a vision of a world transformed from mass production to a lean enterprise. The authors highlight the huge amounts of waste that occur in most organisations and show that a systematic attack on waste, both within companies and along the supply chains, can have tremendous benefits to the short run profitability and long term prospects of companies and organisations.

Lean production methods were pioneered by Toyota in Japan. Lean Thinking distils the essence of the lean approach into five key principles and shows how the concepts can be extended beyond automotive production to any company or organisation, in any sector, in any country.



The five lean principles

1 **Specify** what does and does not create **value** from the customer's perspective and not from the perspective of individual firms, functions and departments

2 **Identify** all the steps necessary to design, order and produce the product across the **whole value stream** to highlight non value adding waste

3 Make those actions that create value **flow** without interruption, detours, backflows, waiting or scrap

4 Only make what is **pulled** by the customer.

5 Strive for **perfection** by continually removing successive layers of waste as they are uncovered.

These principles are fundamental to the elimination of waste. They are easy to remember (although not always easy to achieve!) and should be the guide for everyone in the organisation who becomes involved in the lean transformation.

If you are serious about going lean then the people in your organisation need to read *Lean Thinking* at the outset. If they haven't got enough time to do that they haven't got enough time for creating their own world class Lean Enterprise!

Lean thinking

In order to go lean, you need to understand customers and what they value. To get your company focused on these needs you must define the value streams inside your company (all the activities which are needed to provide a particular product or service) and, later, the value streams in your wider supply chain as well. To satisfy customers you will need to eliminate or at least reduce the wasteful activities in your value streams that your customers would not wish to pay for.

Next you have to find a way of setting the direction, fixing targets and seeing whether or not change is actually occurring. You need a framework to deliver **value** for your customers as well as a toolkit to make the change.

If you can do this effectively you won't need to benchmark competitors to set some arbitrary and often incomparable target; perfection or the complete elimination of waste should be your goal. Sounds good, but back to the real world – if it is so easy why doesn't everyone do it?

Lean Profit Potential

Sometimes we ask ourselves this question, and when we have gathered a few facts about a company, we ask the company's managers. The answer they give is usually something like 'yes, that makes a lot of sense, but we never saw it that way'. The difficulty is that firms often cannot get into this virtuous circle of improvement.

One of the reasons for this is that they have not previously measured the impact of lean and identified the Profit Potential to their organisation and the wider supply chain. The Profit Potential is the effect on the "bottom line" of any activity that occurs during a lean transformation programme. It is likely to help improve the organisation its supply chain and indeed the value proposition offered to their customer base.

Understanding Value & Waste

The rationale behind going lean centres on creating value and removing waste both inside and between companies. This is fundamental to a lean value stream. Improved customer focus and productivity gains lead to leaner operations, which in turn help to expose further waste and quality problems in the system. The systematic attack on waste is also a systematic assault on the factors underlying poor quality and fundamental management problems.

What is Value?

Value is what the customer wants. It consists of their articulated and latent needs and may be expressed as a perception rather than in concise facts and figures. In general there will be a number of key dimensions of customer value, we call these Value Attributes. Examples of Value Attributes include tangible elements such as product features, quality and delivery times as well as more intangible elements such as service and relationship. Each customer will have their own set of Value Attributes for different products and services, although groups of customers may be clustered into distinct market segments.

It is important to start by gaining an external view of value as company's view of what is valuable to their customers is very often wrong or distorted. The description of the customers' value profile becomes strategic as it is the basis of understanding how to create a competitive advantage. It involves the direct participation of the management but, most of all, of the customers, moving from an internal focus towards an external one.

It is our contention that an integrated or holistic process-based approach is the most effective way to drive companies towards a value-based competitive advantage. Remember, customers receive the output of complete processes not just individual departments!

What is Waste?

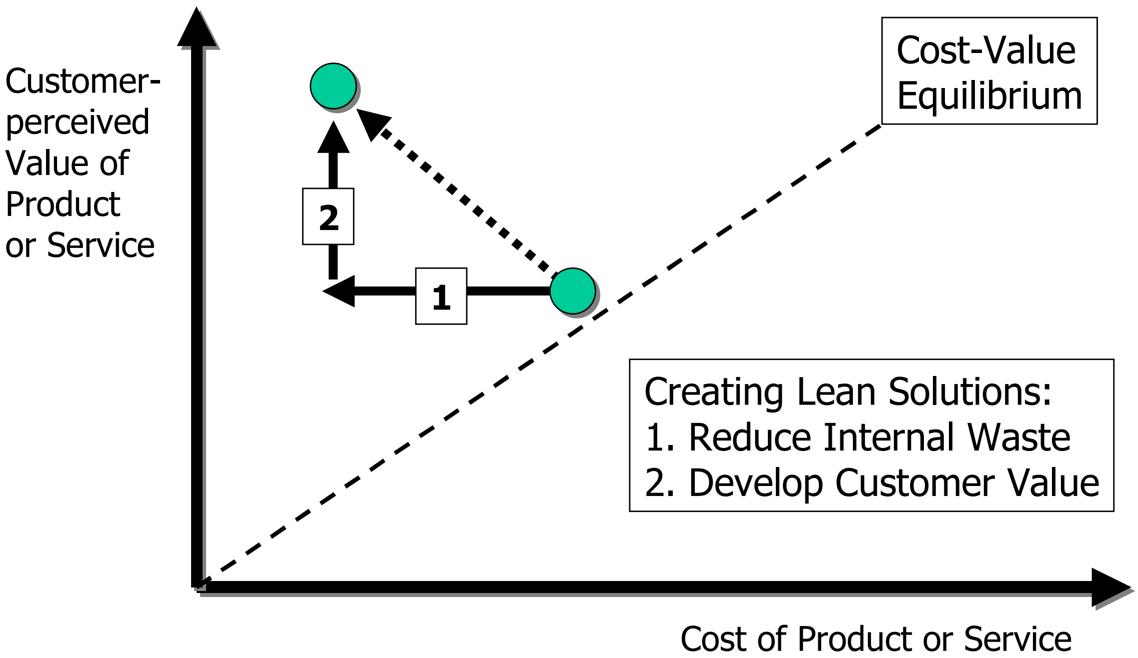
Waste is anything that does not add value to the customer. As a guide, seven wastes were identified by Shigeo Shingo as part of the Toyota Production System. The Japanese call this *muda*.

You might like to use the following chart to make a note of any of these wastes that are present in your business.

Waste	Description	Examples in your organisation
1 Overproduction	Producing too much or too soon, resulting in poor flow of information or goods and excess inventory.	
2 Defects	Frequent errors in paperwork, product quality problems, or poor delivery performance.	
3 Unnecessary inventory	Excessive storage and delay of information or products, resulting in excessive cost and poor customer service.	
4 Inappropriate processing	Going about work processes using the wrong set of tools, procedures or systems, often when a simpler approach may be more effective.	
5 Excessive transportation	Excessive movement of people, information or goods resulting in wasted time, effort and cost.	
6 Waiting	Long periods of inactivity for people, information or goods, resulting in poor flow and long lead times.	
7 Unnecessary motion	Poor workplace organisation, resulting in poor ergonomics, eg excessive bending or stretching and frequently lost items.	

Getting the Balance Right

Clearly it is necessary to balance customer value with the cost of generating it in order to provide a competitive offering. This is true whether your organisation seeks to offer a premium, standard or budget product/service. In the following figure we can plot the degree of customer perceived value for a product or brand against the relative cost of providing it. This latter cost would include the waste involved in providing the product or service. Offerings that are in the premium market would be in the top right part of the figures, those in the budget end of the market, in the bottom left. However, any offering above the diagonal equilibrium line will add value to the customer. Firms in this position are likely to win market share and grow. Those below the line are much less likely to have a comfortable future. A common feature of lean businesses is their movement to an above-the-line position.



In order to develop a successful company one can either consistently and relentlessly remove waste and reach a very cost effective position for their offerings as illustrated by arrow 1. A good example of this is Toyota. Alternatively you might focus on add incrementally or in a step-change way to the perceived value of your product (arrow 2) and achieve a world class market position. BMW have been very adept at doing this. Both of these lean strategies can be very effective and both Toyota and BMW are very profitable. Indeed, Toyota recently announced profit of A$19 billion making them the first Japanese corporation to post a ¥1 trillion yearly profit figure. However, for the typical company some combination of cost reduction and improved customer perception of their product is required to achieve world class status. We will explore increasing customer value in future articles but here we will focus on waste removal.

Four types of activity

When thinking about waste, it is useful to define the four different types of activity within your organisation:

1. *Value adding (VA) activity*: those activities that, in the eyes of the customer, make a product or service more valuable. Examples would include converting iron ore (with other things!) into cars, or mending a broken down car on a motorway. A value adding activity is simple to define, just ask yourself if you as a customer would be happy to pay for it!

2. *Future value adding (FVA) activity*: those activities that, in the eyes of the customer, make a product or service more valuable in some future time period. Examples would include providing marketing information about a product that a customer was not presently aware of, or developing a new product or service.

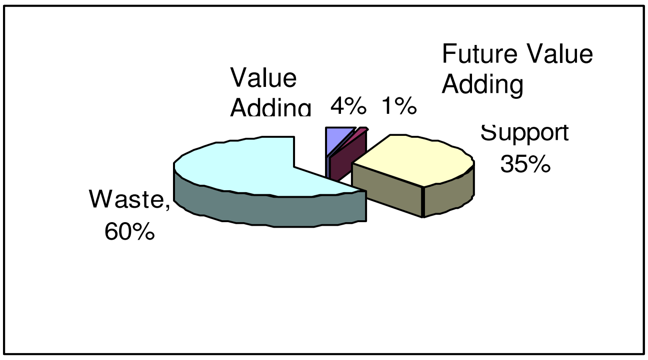
3. *Support activity (SA)* or *necessary non value adding activity:* those activities that, in the eyes of the customer, do not make a product or service more valuable but are necessary unless the existing process is radically changed. Such activities are often difficult to remove in the short term and should be a target for longer term or radical change. An example would be: inspecting every product at the end of a manufacturing line because the firm uses old machinery which is known to be unreliable.

4. *Waste* (W) or *Non value adding activity:* those activities that, in the eyes of the customer, do not make a product or service more valuable and are not necessary even under present circumstances. These activities are clearly wasteful and should therefore be the target of immediate or short term removal. An example of non value adding activity would be transferring a product from one sized container to another so you can move it around your factory.

In past research at LERC we have developed a rough guide as to the proportions of these three types of activity that we might expect to find in a organisation before any lean improvements:

In a *physical product environment* (manufacturing or logistics flow), the ratio between the **time** taken in each of the four types activity in a typical pre-improved organisation is often approximately:

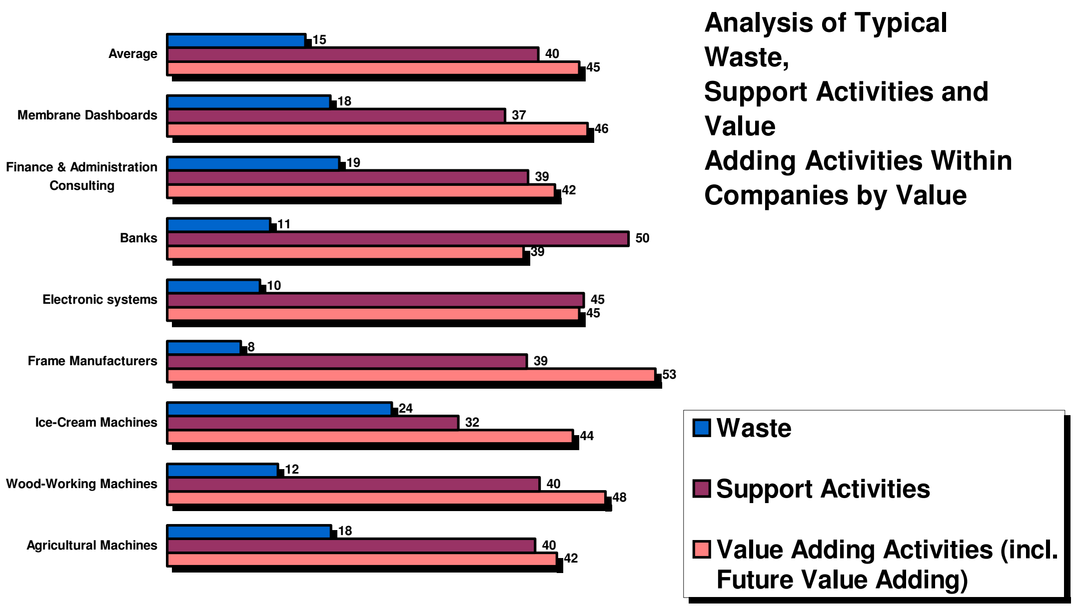
4% value adding activity
1% future value adding activity
35% support activity
60% waste



This does not sound too good until the same figures are seen in an *information environment* (e.g. office, distribution or retail) where a common ratio of total value stream **time** is:

1% value adding activity
1% future value adding activity
49% support activity
49% waste

However, this does not mean that the **cost** of waste is quite such a high ratio. Data collected from a number of different industries found the following position with regard to the internal **cost** of activities:



As we can see, on average in this sample, over 50% of costs within companies is not Value Adding either now or in the future. These figures suggest that in most companies there is considerable scope for reducing waste. We talk about fitting people with '*muda* glasses' – once they are aware of the waste they become increasingly able to see it. The trick then is to create a culture that encourages them to eliminate waste once it has been identified.

This article has been designed to give a brief overview of Lean Thinking. The next article "Extending the Boundaries of Lean Thinking" will take the subject further and develop a framework within which Lean Thinking can be implemented within your own business or your wider Supply Chain.

Professor Peter Hines is Director of the Lean Enterprise Research Centre at Cardiff Business School in the UK. The LERC is the largest worldwide research centre dedicated to the study of Lean Thinking. Peter has worked with Intelog to help bring these learning to Australia.

Andrew Stewart is Managing Director of Intelog. Intelog is a leading Lean Enterprise implementation and training group in this region. Intelog has worked with Professor Peter Hines bringing the latest proven Lean implementation and training material and experience to companies and institutions in this region.

Andrew can be contacted at Andrew@Intelog.com.au