An Info Guide.
The 9 Wastes.

The term “Lean” manufacturing was popularised by Womack and Jones in their book “The Machine that changed the world”. This book benchmarked manufacturing companies around the world and found, at that time, that Japanese manufacturing companies were typically much more productive and efficient than their Western counterparts.

A few years before the “The machine that changed the world” came out Taiichi Ohno had published a book called “Toyota Production System” in it he explained the main foundations of “lean” manufacturing. These principles guided the Japanese companies that were found to be “world class” by Womack and Jones. Taiichi Ohno devised 7 categories which cover virtually all of the means by which manufacturing organisations waste or lose money; these have become known as “The 7 wastes”. 2 more have been added to the classic to make our “9 wastes”.

Waste is the use of resources over and above what is actually required to produce the product as defined by the customer. If the customer does not need it or will not pay for it then it is waste, this includes material, machines and labour. The Japanese word for waste is “muda” and is often used in books, training courses and by lean consultants to mean waste.

The 9 wastes are:

1. Overproduction and early production producing over customer orders, producing unordered materials / goods.
2. Material Transportation handling more than once, delays in moving materials, unnecessary moving or handling .
3. Inventory - unnecessary raw materials in stores, work in process (WIP), & finished stocks .
4. Talent – not using all the skills of your employees
5. People Motion - movement of equipment or people that add no value to the product .
6. Rework or Defects. Producing or reworking scrap.
7. Inappropriate processes - unnecessary processing or procedures (work carried out on the product which adds no value) .
8. Delays. Waiting hanging around, idle time (time when no value is added to the product) .
9. Energy.

Others have included additional categories which include;

Talent and energy are the additions to Ohno’s original 7.

While the “ 9 wastes” is not a tool in itself to tackle the problems within a company which are causing the waste in first place, they do play a valuable role in tackling inefficiency and therefore cost.

The idea of 9 wastes is useful because it allows a company to categorise problems and then focus attention in the appropriate areas once they have been identified. There are many tools and techniques in the lean tool box which can be applied to many areas of production in order to tackle any one of these wastes. A few examples are laid out below.

1. **Overproduction**

Often caused by quality problems, a company know that it will lose a number of units along the production process so produces extra to make sure that the customer order is satisfied. These kind of issue can be tackled using mistake proofing methods (Pokayoke) and by understanding the machine process capabilities of the production equipment. Statistical process control (SPC) will also help monitor production outputs and give warning of problems before they occur.

If the reason a company is overproducing is because of small orders and economic batch sizes then Setup reduction techniques such as SMED can help. If a company can reduce its changeover time then it is then able to produce smaller batches economically.

Overproduction has been said by some to be the worst of the 7 wastes as it encompasses the rest of the wastes, often the main driving force for JIT (Just in time) systems.

2. **Material Transportation**

Factory layouts can often be the fundamental cause of excess transportation. When appropriate, re-laying out the machines within a factory from a functional to a cellular layout has been found by many companies to help not just reduce transportation waste but also reduce WIP and waiting.

Excess inventory levels can also lead to wasted handling.

3. **Inventory**

Many companies order over and above what is required to fulfil the order, this may be due to quality problems along the production process or the often mistaken belief that is saves money by ordering larger quantities. The true cost of excess inventory levels should be carefully analysed before ordering excess raw materials simply because the purchase price is less.

Tackling the root cause of the quality problems should also be a priority.

4. **Talent**

The people in the process work with the day to day frustrations and issues. Understanding and resolving these frustrations can have significant & easy results. Involve all your operators in the solutions and the results and be impressive.

5. People Movement

Simple "Good Housekeeping" is a very effective way of reducing wasted movement by men and materials. 5S is a technique used by many companies to focus effort on keeping the workplace tidy with unused materials and machines disposed off so as not to create unnecessary clutter and therefore searching. Re-laying out the factory can also help reduce "motion" waste.

6. Rework & Defective units

If you don't do it already record and analyse everything that's Not Right First Time, for at least a month. A simple Pareto will help you priorities your efforts.

7. Inappropriate Processes

Rework is a typical example of over processing as discussed earlier reducing the root cause of the quality problem is solution eliminating rework. Techniques such as 5 whys, SPC and mistake proofing (Pokayoke) are available to help identify and eliminate causes of quality defects.

8. Delays & Waiting

Products waiting around in factories either as finished goods or work in progress (WIP) another major cause of waste. WIP is commonly caused by producing large batch sizes where again SMED techniques can help. Delays are also prevalent in information systems, production of schedules & clarity of the next priority.

Concentrating on keeping bottle neck processes going are also a good way of reducing WIP, the book "The Goal" by Eliyahu M. Goldratt has a lot to say on this and has been found to be very useful by many manufacturing managers.

9. Energy

Poor use of all types of energy is a waste & can be expensive. Compressed air or water leaks often get ignores but are expensive. How long is your equipment switched on for ?

Overview

If you were to record all of the non-value added activities carried out in a typical manufacturing company do not be surprised to find out that 99% of all your activities carried out are non-value adding, even the best manufacturers manage 95%. The elimination of waste not just reducing it is a vital component of increasing competitiveness of your organisation.The Manufacturing Advisory Service is available to help small and medium sized manufacturing tackle all the issues causing waste. If you would like help, advice or information about any of the 9 wastes or other techniques raised in this article then please get in touch with our Helpdesk on (0845) 608 38 38.