LEAN PRODUCTION AND QUALITY MANAGEMENT (4.5)

(Chapter 25 - A level 4.5)

Lean production refers to the various techniques a firm can adopt to reduce wastage and increase efficiency/productivity.

The seven types of wastage that can occur in a firm:

- **Overproduction** – producing goods before they have been ordered by customers. This results in too much output and so high inventory costs
- **Waiting** – when goods are not being moved or processed in any way, time is wasted
- **Transportation**-moving goods around unnecessarily is simply wasting time. They also risk damage during movement
- **Unnecessary inventory**- too much inventory takes up valuable space and incurs cost
- **Unnecessary motion** - moving of employees and operation of machinery is a waste of time and cost respectively.
- **Over-processing** -using complex machinery and equipment to perform simple tasks may be unnecessary and is a waste of time, effort and money
- **Defects** – any fault in equipment can halt production and waste valuable time. Goods can also turn out to be faulty and need to be fixed- taking up more money and time

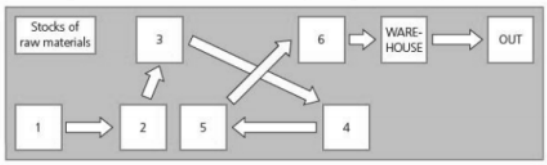
Lean production techniques that aim to reduce these wastes include :

- **Kaizen** - a japanese term meaning continuous improvement
- **Just-in-time methods** - eliminates the need for holding inventory, materials are only ordered when needed and as soon as a product is completed it is delivered
- **Total quality management** (TQM) - Continuous improvement of products and processes by focusing on quality at each stage of production
- **Flexible specialisms** - flexible employment contracts, machinery + multi-skilled workers
- **Simultaneous engineering** - where the development of a product is organised so that different stages like design, market research, costing and engineering tasks are done at the same time. This process is faster and allows for mistakes to be fixed early on
- **Cell production** - a form of flow production where the production line is divided into separate, self-contained units each making a part of the finished product. This works because it improves worker morale when they are put into teams and concentrate on one part alone, improving quality
- **Quality circles** - where employees get together to discuss work related issues and come up with solutions. This helps boost morale and the conclusions can be useful

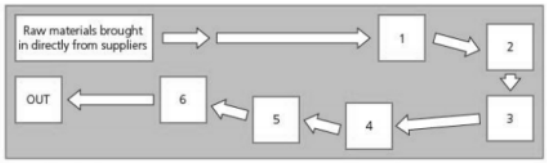
Kaizen

It's a Japanese term meaning 'continuous improvement'. **It aims to increase efficiency and reduce wastage by getting workers to get together in small groups and discuss problems and suggest solutions** (like quality circles). Since they're the ones directly involved in production they will know best to identify issues.

When kaizen is implemented, the factory floor, for example, is rearranged by re-positioning machinery and equipment so that production can flow smoothly through the factory in the least possible time.



The Kaizen effect: before



The Kaizen effect: after

Benefits of kaizen :

✔ Increased productivity - staff feel involved, empowered which helps build teamwork
✔ Can help lower costs and by helping the business be more efficient
✔ Staff are familiar with production so have good insight into resolving production related issues

Limitations of kaizen :

✖ Some staff may be unwilling to participate
✖ Some managers may not want to give control / empower their subordinates
✖ Can be time consuming - time that can be spent working will be wasted on meetings
✖ May require some forms of training (leadership training to organise meetings) so added costs

Lean production summarised :

(✔) Increases overall productivity which improves employee morale
(✔) Minimises waste
(✔) Improves quality and flexibility
(✔) Reduces some costs
(✖) Implementing process can be time consuming and difficult
(✖) In most cases expensive
(✖) Over-reliability on suppliers (JIT)
(✖) A risky process that requires many factors to work (such as good employees etc.)

Quality

Quality means to produce a good or service which meets customer expectations. The products should be free of defects. Quality is important because it :

- Establishes a brand image
- Builds brand loyalty
- Maintains good reputation
- Increases sales - can charge a higher price
- Attracts new customers
- Makes it easier to launch new products

If there is no quality, the firm will :

★ Lose customers to other brands
★ Have to replace faulty products and repeat poor service,increasing costs
★ Develop a bad reputation leading to low sales and profits

There are four methods a business can implement to achieve quality: **quality control**, **quality assurance, total quality management** and **benchmarking.**

Quality control

Quality control is the checking for quality at the end of the production process, whether a good or a service. This is done through use of testing, random sampling and inspection.

The three stages to effective quality control are :

1. Prevention
2. Inspection
3. Correction and improvement

Advantages:

✔ Eliminates the fault or defect before the customer receives it, so better customer satisfaction
✔ Not much training required for conducting this quality check

Disadvantages:

✖ Still expensive to hire employees to check for quality
✖ Quality control may find faults and errors but doesn't find out why the fault has occurred, so it's difficult to solve the problem
✖ if product has to be replaced and reworked, then it is very expensive for the firm

Quality assurance

Quality assurance is the checking for quality *throughout* the production process of a good or service.

Advantages :

✔ Eliminates the fault or defect before the customer receives it, so better customer satisfaction
✔ Since each stage of production is checked for quality, faults and errors can be easily identified and solved
✔ Products don't have to be scrapped or reworked as often, so less wastage than quality control

Disadvantages :

✖ Expensive to carry out since quality checks have to be carried throughout the entire process, which will require manpower and appropriate technology at every stage.
✖ How well will employees follow quality standards? The firm will have to ensure that every employee follows quality standards consistently and prudently, and knows how to address quality issues.

Total quality management (TQM)

Total Quality Management or TQM is the continuous improvement of products and production processes by focusing on quality at each stage of production. There is great emphasis on ensuring that customers are satisfied.

In TQM, customers just aren't the consumers of the final product. It is every worker at each stage of production. Workers at one stage have to ensure the quality standards are met for the product in production at their stage before they are passed onto the next stage and so on. Thus, quality is maintained throughout production and products are error-free.

TQM also involves quality circles and like Kaizen, workers come together and discuss issues and solutions, to reduce waste and ensure zero defects.

Advantages :

✔ Quality is built into every part of the production process and becomes central to the workers
✔ Eliminates all faults before the product gets to the final customer
✔ No customer complaints and so improved brand image
✔ Products don't have to be scrapped or reworked, so reduced waste and lesser costs

Disadvantages :

✖ Expensive to train every single employee

✖ Relies on all employees committed to following TQM– how well are they motivated to follow the procedures?

Benchmarking

Benchmarking refers to the process of management identifying the best firms in the industry and then comparing the performance standards – including quality – of these businesses with those of their own business.

The process of benchmarking is as follows :

1. **Identify the aspects of the business to compare** - quality, delivery speed etc.
2. **Measure performance in those areas** - using customer complaints etc.
3. **Compare those areas with the areas of best businesses in that industry**
4. **Set new standards for improvement** - after identifying weakness
5. **Change processes to achieve standards** - performing tasks differently etc.
6. **Re-measure against same businesses** - are there improvements?

Benefits of benchmarking include :

✔ Faster and cheaper way of solving issues within a firm
✔ The areas that are most important to customers are identified
✔ Helps the firm become more competitive

Limitations of benchmarking include :

✖ Copying the ideas and practices of other firms lacks originality
✖ The costs of obtaining comparison data can be expensive and not easily recovered
✖ The process depends on getting relevant and up-to date information about other firms in the industry, this can be difficult

Additional info :

How can customers be assured of the quality of a product or service?

They can look for a quality mark on the product like **ISO** (International Organisation for Standardisation). The business with these quality marks would have followed certain quality procedures to keep the quality mark. For services, a good reputation and positive customer reviews are good indicators of the service's quality.