



DP IB Business Management: HL



Your notes

5.3 Lean Production & Quality Management

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Lean Production

Features of Lean Production

- Lean production is a management philosophy that aims to **maximise value** while **minimising waste**
- It focuses on **maximising efficiency, improving quality and reducing costs**

The main principles of lean production

- **Right first time approach**
 - Aim for **zero defects** in output
 - Identify and solve problems as they arise
 - Prevent rather than correct errors
- **Flexibility**
 - Adaptable capital equipment and physical resources
 - Multiskilled staff and team working
 - Flexible management styles
- **Waste Minimisation**
 - Remove processes that do not contribute to added value
 - Consume as little as is necessary
 - Rework rather than replace
- **Effective supply chain management**
 - Develop excellent relationships with suppliers
 - Minimal number of suppliers
- **Continuous improvement**
 - Ongoing, small steps
 - All staff involved in improvement

The seven wastes eliminated in lean production

- Waste refers to anything that prevents a business from being **efficient**

- First developed in **Japan** in the 1970s, **seven key types of waste** are minimised in lean production
 1. **Transportation:** Unnecessary movement of materials or products
 2. **Inventory:** Excess raw materials, work-in-progress, or finished goods
 3. **Motion:** Unnecessary movement of people or equipment
 4. **Waiting:** Delays or idle time in the production process
 5. **Overproduction:** Producing more than what is required by the customer
 6. **Overprocessing:** Using more resources than necessary to produce a product
 7. **Defects:** Products or services that do not meet customer requirements



Examiner Tips and Tricks

Reducing waste appears to be logical and, to some extent, is something that every business will aim to achieve - this does not necessarily mean that they are lean organisations

Lean production is a systematic, whole-business approach to the reduction of waste. It is the bedrock of the business and determines every single choice made. Waste reduction is at the centre of every process and a culture of improvement is embedded.

Continuous Improvement (Kaizen)

- Kaizen involves a business taking **continuous steps** to **improve work processes** and **productive efficiency**
 - **Changes are small and ongoing** rather than significant one-off's and are **constantly reviewed** to ensure that the desired positive impact on productivity is achieved

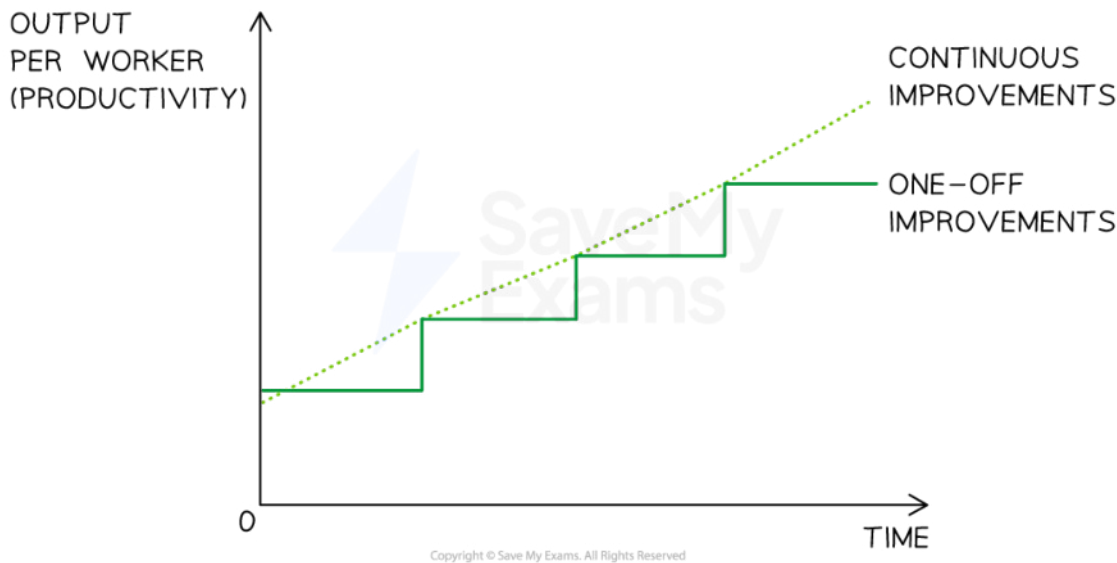
Diagram: the Impact of continuous improvements on efficiency



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Continuous improvements increase efficiency over time

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- Elements of Kaizen commonly include
 - **Total Quality Management**
 - **Team Working** and **quality circles**
 - **Zero defects** in manufacturing
 - High levels of automation
 - High levels of cooperation between **workers and management**
- Kaizen requires a **long-term management commitment to change**
 - Regular high quality training for all staff
 - Willingness to accept suggestions and delegate control to **subordinate workers**
 - Skills to implement and manage continual change
- **It is unlikely to cause workplace conflict**
 - Workers do not face **sudden significant change**
 - Workers are wholly **involved** in - and contribute to - continuous improvement

Just-in-time (JIT)



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- **Just in Time (JIT) stock management** is a process in which raw materials are **not stored onsite** but ordered as required and delivered by suppliers 'just in time' for production
- Careful coordination is required to ensure that raw materials and components are delivered by suppliers **at the moment that they are to be used**
 - **Close** relationships with suppliers need to be developed
 - Suppliers may need to be in **close proximity**

The Advantages and Disadvantages of Just in Time Stock Management

| Advantages | Disadvantages |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> ▪ Stockholding costs including storage costs are minimised ▪ Close working relationships are developed with a small number of trusted suppliers ▪ Cash flow is improved as money is not tied up in stocks ▪ Unused storage space is available for productive use ▪ Teamwork is encouraged so employee motivation is likely to be improved | <ul style="list-style-type: none"> ▪ Bulk buying economies of scale are not generally possible ▪ The ability to respond to unexpected increases in demand is reduced ▪ Administrative costs related to frequent ordering are increased ▪ Unreliable suppliers (e.g. late or poor quality deliveries) can quickly halt production ▪ Significant changes to organisational structure and production controls are required |

Cradle to Cradle Design

- The traditional "cradle to grave" approach refers to the **one-time use** of a product
 - Products are designed with a linear life cycle that ends in **disposal**
 - This approach has led to an unsustainable increase in **waste going to landfill** and associated **environmental concerns**
- The Cradle to Cradle (C2C) model aims to shift towards a **circular economy**
 - **Resources are conserved** and **waste is minimised**
 - It is focused on **thoughtful design** and **responsible manufacturing** practices

Key Principles of Cradle to Cradle Design and Manufacturing

| Principle | Explanation | Example |
|-----------|-------------|---------|
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| <p>Use responsible materials/components</p> | <ul style="list-style-type: none"> Materials that can be safely returned to the environment to decompose and nourish the soil Materials that can be endlessly recycled without degradation | <ul style="list-style-type: none"> Elemis packaging can be returned to a retailer or by post. It is cleaned, refilled and sent back to the retailer to be sold again |
| <p>Design for Disassembly</p> | <ul style="list-style-type: none"> Products are designed with the intention of being easily disassembled at the end of their life cycle so that components can be reused or recycled | <ul style="list-style-type: none"> Swedish accessories brand Freitag sells compostable workwear featuring metal buttons that can be unscrewed and removed from the garment easily, allowing them to be collected and used again and again |
| <p>Use renewable energy</p> | <ul style="list-style-type: none"> The manufacturing process relies on renewable energy sources to minimise the environmental impact associated with energy consumption | <ul style="list-style-type: none"> Unilever uses 100% renewable electricity across all its factories, offices, R&D facilities, data centres, warehouses and distribution centres They also generate their own power with on-site solar installations in some countries |
| <p>Water stewardship</p> | <ul style="list-style-type: none"> Responsible and considerate water usage to protect local ecosystems, emphasising conservation and clean water practices | <ul style="list-style-type: none"> Levi Strauss's <i>Water<Less</i>[®] initiative reduces water use in the production of clothing across all of its manufacturing facilities |
| <p>Stakeholder responsibility</p> | <ul style="list-style-type: none"> Social aspects including fair labour practices, community engagement and the worker well-being are considered | <ul style="list-style-type: none"> Netflix uses its social media platforms to show support for movements such as Pride month, environmental sustainability and Black Lives Matter |

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| Continuous improvement | <ul style="list-style-type: none">▪ Making small, ongoing improvements with the goal of creating products that are increasingly sustainable over time | <ul style="list-style-type: none">▪ Coca Cola is aiming for 'a world without waste' by collecting and recycling every bottle, making their packaging 100% recyclable and replacing all water used in creating their drinks back to the environment to ensure water security |
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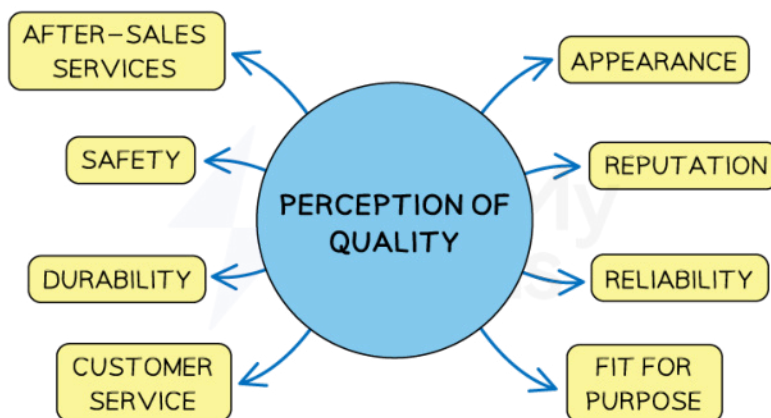
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Quality Management

An Introduction to Quality Management

- **Quality management** involves a business carefully considering the characteristics and **features** of a product that **satisfy the needs of customers** and ensuring that it has **effective systems and procedures** to meet these
- Businesses need to **maintain a level of quality** that continues to attract and retain customers if they want to remain successful
- Customer **perceptions of quality** are related to a range of product or business features

Diagram: factors that influence quality perception



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The perception of quality is influenced by appearance, durability and the quality of customer service

- Customers may consider products or services to be of **good quality** if they
 - **Look good** and are sold by a **reputable** business or brand
 - Are **reliable** and **durable**
 - Are **safe** and **fit for purpose**
 - Receive good customer service, including **after-sales service**



Examiner Tips and Tricks



High quality may provide justification to charge a premium price for products

However, it is not always the case that good quality leads to increased sales

For many customers as long as a product's quality is 'good enough' they will be reluctant to upgrade to a more prestigious brand, especially when their incomes are squeezed

Measuring Quality

- Businesses can measure the quality of their output in a range of ways

| Reject Rates | Product Returns | Product Recalls |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> The percentage of output considered not fit for sale | <ul style="list-style-type: none"> The percentage of items returned by unsatisfied customers | <ul style="list-style-type: none"> Incidents of products brought back to be corrected |

- In addition factors such as **customer satisfaction**, **customer loyalty** and **market share** can provide useful indications of customer experiences and perceptions of quality
 - Customers satisfied with quality are less likely to make **complaints** and are likely to give **positive feedback** in surveys
 - High quality can drive **repeat purchases**
 - Increased market share** may demonstrate satisfaction with quality over that offered by rival products/services

Categories of Quality Management

- A businesses **approach to quality management** falls into one of two categories
 - Quality control** involves inspecting the quality of output **at the end** of the production process
 - Workers focus on **maximising output**
 - Products that **do not meet standards** are **rejected** before they are released for sale
 - Quality assurance** involves inspecting the quality of production **throughout** the process
 - Workers **check their own work** and, sometimes, the work of others at **various stages of production**
 - Some business take a **whole business** approach to quality assurance with systems such as **quality circles**, **benchmarking** and **Total Quality Management (TQM)**

An Evaluation of Approaches to Quality Management



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| Method | Benefits | Drawbacks |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quality Control | <ul style="list-style-type: none"> Quality specialists are employed to check standards An inexpensive and simple way to check that output is fit for purpose | <ul style="list-style-type: none"> The rejection of finished goods is a significant waste of resources There is little focus on the cause of defects |
| Quality Assurance | <ul style="list-style-type: none"> Quality issues are identified early so products may be reworked rather than rejected The cause of defects is the focus so future quality issues may be prevented | <ul style="list-style-type: none"> Staff training and a skilled workforce is required so labour costs may be increased Reworking may lengthen the production process |

Quality Assurance Using Quality Circles

- Quality circles involve **groups of workers** meeting regularly to **identify and solve quality problems** in the production process
 - Groups are made up of **volunteers** from different departments
 - Meetings are typically chaired by a **senior leader**
 - Members **work together** to **execute and manage solutions**

An Evaluation of Quality Circles

| Advantages | Disadvantages |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> Improved worker motivation as they are involved in decision making Relevant and focused solutions are likely as workers are familiar with processes Improved productivity as workers are engaged in solutions they have developed themselves | <ul style="list-style-type: none"> Management need to have trust in workers' views and solutions Workers are likely to need ongoing training to be able to contribute most effectively Meetings and structures must be organised regularly |

Quality Assurance Using Benchmarking

- Benchmarking** involves a business **comparing its quality and performance** with market leaders within the same industry



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- Benchmarking can be internal or external

Internal benchmarking

- Comparison of different functions within a business such as finance and marketing
 - **Performance**
 - Comparison of key performance indicators such as labour productivity or labour turnover rates
 - **Process**
 - Comparison of business operations and processes such as call centre queue times or delivery times

External benchmarking

- Comparison of key performance indicators (such as product recalls) against those of market leaders in an industry
- **International** benchmarking compares key performance indicators against those of market leaders overseas

An Evaluation of Benchmarking

| Advantages | Disadvantages |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> ▪ Helps identify areas where businesses can improve their performance by learning from the best practice of other successful companies ▪ Can identify innovative practices and processes used by competitors ▪ Can support the setting of realistic performance goals by comparing current performance with industry standards ▪ Workers may feel a sense of pride and motivation when they see their employer striving to be a leader in the industry | <ul style="list-style-type: none"> ▪ Differences in metrics used to measure performance can affect the accuracy and comparability of benchmarking data ▪ Best practices from market leaders may not always be directly applicable to the unique needs of a specific business ▪ Small businesses may struggle to find the time and resources for data collection, analysis and implementation required for benchmarking ▪ Focusing too much on benchmarking against competitors may lead to a narrow view of success that ignores ideas for improvements that come from other sources |



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Quality Assurance Using Total Quality Management (TQM)

- Total Quality Management (TQM) places **quality at its core** and makes **every worker responsible for quality** throughout the business
 - Quality is considered from the **customer's perspective**
 - Inefficiency** and **wastage is removed** from **every** business activity or function - including those that are not directly related to production

An Evaluation of TQM

| Advantages | Disadvantages |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> Quality in all aspects of the business improves efficiency which should lead to improved profitability A positive culture of constant improvement and high standards exists throughout the business | <ul style="list-style-type: none"> All workers must be committed and receive significant continued training Careful monitoring and control is required by managers capable of setting a good example |

The Benefits of Lean Production & TQM

- Implementing lean production and TQM can have a positive impact on various aspects of a business
 - It can lead to **higher profits** as a result of **greater efficiency**, **less waste** and **lower costs**
 - Fewer errors can lead to improved **customer satisfaction** and **greater customer loyalty**

Positive Impacts of Lean Production and TQM

| Benefit | Explanation |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waste reduction | <ul style="list-style-type: none"> By eliminating all forms of waste costs are reduced and overall profitability is likely to be improved |
| Streamlined processes | <ul style="list-style-type: none"> Removing unnecessary steps from business processes leads to faster production and improved efficiency |
| Improved quality | <ul style="list-style-type: none"> The strong emphasis on detecting and eliminating defects early in the production process improves product quality and customer satisfaction |



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| | <ul style="list-style-type: none"> This focus on customer satisfaction can lead to increased loyalty and repeat business |
| Employee empowerment | <ul style="list-style-type: none"> Taking ownership of quality can lead to increased employee morale and engagement |
| Environmental Impact | <ul style="list-style-type: none"> The focus on waste reduction often results in a lower environmental impact through lower energy consumption, reduced emissions and minimal resource usage |

- However, successful implementation of lean production is likely to require a **cultural shift** and **ongoing efforts to sustain improvements**
 - Commitment to **careful recruitment, training and engagement** of employees
 - '**Getting it right first time**' should be at the heart of all processes
- It also needs **strong relationships with suppliers**
 - Defect-free** components must be delivered **on-time**, in the **right quantities**
 - Trust** needs to be developed with a **small number of suppliers**, emphasising **quality rather than cost** alone



Examiner Tips and Tricks

When developing a longer response that requires a justified decision, make sure that you consider the advantages and disadvantages of both options

This analysis should be wide ranging - that is, you should consider the impact on a variety of business functions, stakeholders, aims and objectives. Try to avoid focusing too much on financial aspects - though these should be covered.

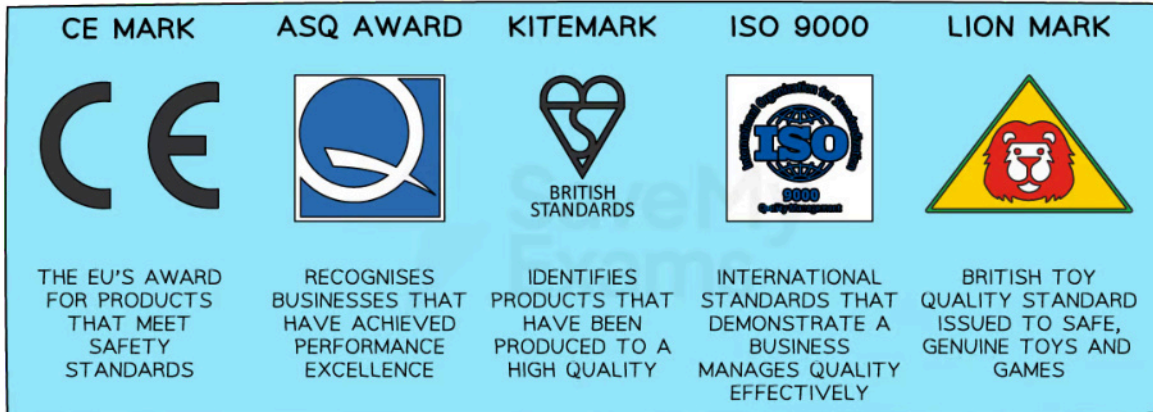
National & international Quality Standards

- Quality standards** include national and international **benchmarks** that demonstrate a businesses **commitment to quality**
 - They are administered by **independent bodies** that carry out **stringent tests** to ensure standards are met or exceeded
 - Businesses awarded these standards are **revisited regularly** to ensure that standards are maintained

Diagram with a Selection of Quality Standard Accreditations



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Meeting strict international quality standards helps businesses to enter new markets more effectively

The Importance of Quality Standards

- Achieving accreditation reassures customers of their commitment to quality
- Accreditation also provides a range of further benefits
- Having quality accreditation can set a business apart from competitors
- Obtaining quality accreditation can allow a business to enter these markets
- They reduce the risk of legal issues and penalties



Examiner Tips and Tricks

You will not need to write about specific quality standards – it is enough to demonstrate an understanding of the types of protection they provide to consumers