

HIGHER BUSINESS MANAGEMENT



THE OPERATIONS/PRODUCTION DEPARTMENT

1 Explain the costs and benefits of production methods used in large organisations

Operating systems

An operating system is a configuration of resources combined for the provision of goods and services.

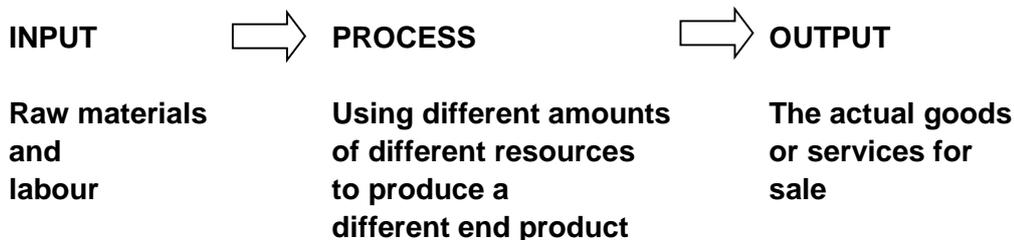
Ray Wild, *Essentials of Production and Operations Management*, 2nd edn

When deciding on an appropriate operating system a business must identify:

- a suitable factory layout for efficient production
- labour and capital requirements
- the flow of work
- quality control methods
- the distribution of finished goods.

Access to raw materials, machines and workers does not guarantee that a business will obtain the outcomes it requires – organisation is essential. Procedures must be established which control and direct what is done, whom it is done by and when. This is known as an operating system.

All operating systems have three distinct phases:



Depending on the product or service being produced there will be a different mix of labour, raw materials and machinery used during the operations process.

Operations management

Operations management is concerned with the efficient conversion of an organisation's resources into the goods or services that it has been set up to provide.

Howard Barnett, *Operations Management*

The role of the operations department can be summarised as follows:

- Purchase of raw material to meet production requirements.
- Managing the receipt, storage and use of stock.
- Ensuring appropriate methods of production are used.
- Implementing quality control techniques to ensure maximum quality output is achieved from minimum inputs.
- Warehousing and distribution of the finished goods.

Production systems

The production function exists in all types of organisation; service industry as well as manufacturing. It is concerned with the transformation of a variety of inputs such as information, people, materials and finance into a variety of outputs such as goods, services, customer and employee satisfaction. Viewed in this way, all organisations can be shown to have a production system irrespective of their primary objective.

David Needle, *Business in Context (An Introduction to Business and its Environment)*, 2nd edn, International Thomas Business Press, 1994

Hence, although many of the examples used here are of manufacturing production, similar principles apply to the production of services, for instance the provision of insurance.

A production system must be chosen to suit the product being manufactured.

An example of manufacturing/production

The product: Chocolate-covered crunch biscuits

<p>Stage 1 – Raw materials Flour, sugar, fat, syrup, water, raising agents, flavours</p> <p>INPUT</p>	<p>Input issues –purchasing mix considerations include:</p> <ul style="list-style-type: none">• best price• dependence on suppliers (reliability etc)• delivery time• availability of quality• usage (quantity required each day)• storage space available
<p>Stage 2 – Stages of production Blending, rolling, cutting, baking, enrobing (covering with chocolate), cooling</p> <p>PROCESS</p>	<p>Process issues – production considerations include:</p> <ul style="list-style-type: none">• average demand per week• production capacity available• working procedures (health/safety/hygiene)• storage available for finished product• efficiency/productivity• payment systems• quality issues• stock control
<p>Stage 3 – Stages of distribution Boxing, wrapping, storing, dispatching</p> <p>OUTPUT</p>	<p>Output issues – distribution considerations include:</p> <ul style="list-style-type: none">• packing individual items and groups of items• nature/size of containers• storage space available before dispatch• organising customer orders• transporting (to further storage or to customers)• customer requirements

Main Methods of Production

A business must operate in the most efficient way possible, ie it must find the most cost-effective and quickest method of production. The choice of production method will depend on:

- the product being produced
- the size of the market
- the size of the business
- the finance available
- the technology available.

There are a **number of additional factors** that must be taken into account when deciding on the method of production to be used in a business. These include:

- the nature of the product, for example bread and washing machines will be produced using different methods
- the quantity of finished goods needed, ie a small number of unique items will be made using job production, large quantities of identical items will be produced using flow production
- quality control measures, for example TQM
- stock control, for example just in time
- relationship with suppliers
- distribution and delivery, for example warehousing and transport costs
- scheduling to meet demand.

Only once all of the factors affecting production have been assessed can the organisation make a decision on the most appropriate system for it to use at any particular point in time.

Job production

Job production is when each job is completed in its entirety before another job is completed.

The item(s) are produced to the customer's own specification, for example:

- an individually designed house
- a conservatory/house extension
- road and bridge construction
- a customised cake
- an individually designed wedding gown
- a tattoo.

The emphasis is on individuality and so job production is often found in smaller businesses, where product differentiation is easily maintained.

Features of job production:

- very customer orientated
- high-priced products
- requires a high amount of skilled labour (labour-intensive production).

Advantages

- ✓ Organisation of production is relatively simple.
- ✓ Suitable for 'one-off' orders that can be designed specifically for the requirements of a particular customer.
- ✓ Specifications can sometimes be changed during production.
- ✓ Workers are likely to be involved in the whole process – they can see the results of their efforts and may be more motivated.

Disadvantages

- × Production costs may be high – there are few, if any, economies of scale.
- × Wages may be higher as workers may require highly developed skills – labour intensive.
- × Production may take some time, for example each job will have to be set up separately, may require individual design etc.
- × Producers require versatile equipment in order to produce a range of different outputs.

Batch production

Batch production is the production of groups of similar products. The products will have a degree of similarity, although different ingredients may be used. No item moves to the next stage until all are ready.

Example include:

- tinned foods, for example soup
- bread, for example white, wholemeal, 50/50
- chocolate bars, for example Dairy Milk, Dairy Milk Caramel etc
- houses, for example a new housing estate.

In this case a number of products (ie a batch) are produced at once. Each product in each batch is the same, but products may vary from batch to batch.

Features of batch production:

- lower unit costs than job production
- larger quantities produced
- common in the food industry.

Advantages

- ✓ Flexibility – individual batches can be designed to meet the requirements of particular customers.
- ✓ Some scope for specialisation, which can reduce costs, for example workers can concentrate on one stage in the process, more specialist machinery can be utilised.
- ✓ Stocks of partly finished goods can be built up quickly – this can help the business to respond quickly to new orders.

Disadvantages

- × Small batches can mean higher costs of production per unit.
- × If batches differ from each other, delays may occur in changing/cleaning machinery.
- × Production of different batches has to be co-ordinated, which may be a difficult and time-consuming task.
- × Less job satisfaction and motivation due to repetitive nature of work.
- × Storage/warehousing costs of partly finished goods.

Flow production

Flow production uses a production line and the product passes through various stages along the line, with component parts being added at each stage. This is most frequently seen in large mass production businesses where standardisation of products is essential.

Example include:

- cars
- white goods (washing machines, fridges etc)
- newspapers
- computers
- TVs
- bottled products.

There is a continuous output of products, all of which are much the same.

Features of flow production:

- low unit price from economies of scale
- high capital costs
- specialised equipment/machines required
- highly automated production
- uses computer-aided design and manufacture.

Advantages

- ✓ Economies of scale can be gained through specialisation of machinery, workers, etc, which can lead to lower unit costs.
- ✓ Automation becomes easier, for example use of robots on the production line.
- ✓ Reduction in labour costs due to automation.
- ✓ Costs of stockholding, etc can be reduced through systems like just-in-time.
- ✓ Quality systems can be built into the process to maintain product specifications.

Disadvantages

- × Standardised product that may not meet the requirements of all customers.
- × Start-up costs are high – capital intensive.
- × Mass production requires mass consumption – if demand falls the whole system may be threatened.
- × If part of the system fails, the whole system may not be able to function.
- × Work on production lines tends to be repetitive and boring – problems with motivation, high turnover and absenteeism.

Production Methods Man v Machine



Production will either be **labour intensive** or **capital intensive** and there are advantages and disadvantages of using both methods. Ultimately the choice is **man v machine**.

Labour-intensive production is where a business uses a **larger proportion of human input** than machinery to **complete the production process**, for example fruit picking, postal services and the hospitality industry.

Labour-intensive production is used when:

- the cost of labour is relatively cheaper than the cost of machinery
- the production process requires specific skills
- the use of machinery would be impractical due to lack of space or mobility
- the production process relies on the ability of humans to think, act on initiative and problem-solve
- the production process requires flexibility, for example job production will use a high proportion of labour as specialist skills will be needed to make unique products.

Labour-intensive production	
Advantages	Disadvantages
<ul style="list-style-type: none">• Additional flexibility due to human skills – can make one-off items• More responsive to change• Lower start-up costs than capital-intensive production as no initial outlay on machinery/equipment• The use of human judgement is needed, which can improve the process	<ul style="list-style-type: none">• A skilled workforce can be expensive to recruit, pay and train• Business cannot take advantage of economies of scale• Staff illness or absence can impact on the production process• Additional quality control measures may be required due to human error• Can be less efficient than capital-intensive production

Capital-intensive production is where the production process relies more on machinery and other capital equipment relative to human input. This type of production is used to produce goods on a large scale, for example cars and washing machines.

Capital-intensive production is used when:

- the supply of labour is limited
- the production process is routine and repetitive
- the cost of the capital is relatively cheap compared to labour
- the use of machinery improves the quality and accuracy of production
- the use of machinery improves efficiency and consistency of output.

Capital-intensive production is more likely to be associated with batch or flow production. It can be further categorised as follows:

Mechanisation is where humans use machinery to help them in the production process, often to replace the physical, muscular part of the process. Human judgement is still required.

Automation is a step further than mechanisation, where control systems and information technology are used to manage production, reducing or replacing human intervention. Automation removes the need for human judgement.

Automation is often the most cost-effective method of production. However, when a business moves from a **labour-intensive to either a mechanised or automated** method of production, **redundancies occur**, which could lead to **negative publicity for the business**.

Capital-intensive production	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Machinery can operate 24/7 • Higher volume of goods can be produced • Quality of output is standardised and consistent • Removes the chance of human error • Machines can do work that would be dangerous or hazardous to humans 	<ul style="list-style-type: none"> • Large initial outlay to purchase machines • Cost of maintaining and repairing equipment can be high • Is only suitable for standardised production process – more difficult to adapt to change • Production time is lost if machines break down • Worker motivation is low and they are deskilled • Can lead to redundancies

2 The use of current technologies in Operations

Technology

Computer-aided design



Computer-aided design (CAD) is the use of computer software to assist in the creation, modification and analysis of a product during the design process. The product can be built and tested virtually to ensure it meets the needs of the customer and the business, which reduces the cost of creating and then modifying a prototype.

CAD is used extensively in industries such as car design, shipbuilding, architecture and engineering.

The advantages of CAD are:

- more accurate than hand drawings therefore reduces human error
- increases the productivity of the designer as designs can be saved and modified on the computer instead of new hand drawings being created
- images can be saved to be edited at a later date
- images can be sent via email
- images can be viewed in two and three dimensions.

The disadvantages of CAD are:

- the initial cost of the software is high
- computers need a large amount of processing power to support the software
- staff need to be trained to use the software.

Computer-aided manufacture



Computer-aided manufacture (CAM) is the use of computers in the manufacturing process. Machinery and other equipment are regulated by a computer which is programmed to control and co-ordinate each stage of the production process.

CAM is an appropriate method of manufacturing when a large number of identical items are being produced, for example in the electronics, car and textile industries.

The advantages of CAM are:

- improved efficiency as production can occur 24/7
- improved accuracy and consistency as human error is eliminated
- reduction in waste
- machines will work at a programmed pace therefore speed of production is more predictable.

The disadvantages of CAM are:

- high initial outlay to purchase the machines/computers
- production will stop if machinery/computers breakdown.

Electronic point of sale

An **electronic point of sale (EPOS)** system is a combination of **hardware and software** that allows a business to maintain **accurate stock and financial records**. The system can also be extended to provide valuable information about **customers' buying habits**.

An **EPOS system** improves stock control as it **uses barcodes** to:

- **record products received** into stock
- **record products sold**
- **update stock levels frequently and accurately**
- provide **accurate pricing information**
- **identify demand** for products.

The **scanners** should **be linked to a spreadsheet package** that can **calculate stock** using **formulas** and can alert businesses when stock needs to be **re-ordered**.

This **minimises** the need for a manual stock count.

EPOS helps a business **minimise the risk of holding too much or too little stock**.

An EPOS system can be linked to a business's website so that customers using e-commerce can **check stock availability**. They can identify **if the product is in stock** and when it will be delivered, register for stock alerts and reserve goods online to collect in store.

In addition to stock control, **EPOS can readily be adapted to monitor customer behaviour**.

The advantages of electronic stock control are:

- improved efficiency as stock taking can occur 24/7
- improved accuracy and consistency as human error is eliminated
- reduction in waste
- reduction in risk of under or over stocking
- alarms can be set to signify re-order level

The disadvantages of electronic stock control are:

- high initial outlay to purchase the machines/computers
- stock control will stop if computers breakdown.

3 Describe the features and outline the purpose of an effective stock management control system.

Stock management

Purchasing stock

The importance of purchasing varies according to the size and nature of the organisation. For example, in service industries, such as hairdressing, there is very little purchasing and 'production' depends on the skill of the staff, rather than the products that they use. However, in manufacturing industries, where large amounts of raw materials or component parts are used to produce the final goods, it is very likely that the firm will have a purchasing department and employ a team of specialists in order to remain competitive. This department is responsible for obtaining the best quality materials, at the lowest cost and delivered in the correct quantities at the correct time. This is known as the purchasing mix.

The purchasing mix

It is essential that a business has an excellent relationship with its suppliers. When deciding on the quantity of stock to be purchased and the supplier to choose it is necessary to consider the following factors:

Quality	<ul style="list-style-type: none">• Is the quality of stock offered by the supplier acceptable to the business?• Will the quality of stock be consistent?
Quantity	<ul style="list-style-type: none">• Can the supplier deliver the amount of stock needed at the right time?• Will all orders be completed in one delivery?
Time	<ul style="list-style-type: none">• Can the supplier meet the delivery date requirements?(lead time)• How long will it take from the order being placed to it being received (lead time)?
Dependability	<ul style="list-style-type: none">• Will the supplier be reliable and deliver goods when promised?• Does the supplier have a good reputation?• Will supplies be received in good condition, for example undamaged?
Price	<ul style="list-style-type: none">• Is the price being offered the best available?• Will discounts be received for buying in bulk/repeat orders?• Will credit terms be available?• Is the business receiving good value for money (remember – this does not mean the cheapest!)?
Location	<ul style="list-style-type: none">• Is the supplier local?• Will distance cause problems, for example lead time?• Are there any additional charges for delivery or insurance?

Stock control

A business must balance the needs of the production department with the cost of holding stock. There are three categories of stock which a business must store:

- raw materials
- work in progress
- finished goods.

When deciding on the quantity of stock to be purchased, the following factors must be considered:

- level of stock currently held
- time taken for new stock to be ordered and delivered
- amount of raw materials to be used in the lead time
- storage space available and the cost of storage.

Problems with holding too much stock

- High storage costs. Space used to store large quantities of stock could be used for a more profitable purpose.
- Capital tied up in stock could be used more effectively elsewhere in business.
- Additional security, maintenance and insurance costs.
- Stock may deteriorate before being used.
- Stock could be stolen by employees.

Problems with holding too little stock

- Important/unexpected orders cannot be met and may be lost.
- Production has to stop, costing the business money.
- Increased administration costs as orders have to be placed more frequently.
- Bulk discounts may not be available.
- Could result in a poor reputation.

To ensure an **efficient and effective stock control system** many businesses **employ staff to monitor, control and record stock to avoid theft**, waste or stock running out. Procedures should be implemented for the receipt and issue of stock.

This is usually done with the **aid of an EPOS system** that uses barcodes to record stock received into the business and issued to the production department. The **software can be programmed to recognise minimum level, maximum level and re-order level**.

Having the correct quantities of materials at any one time is essential. Effective stock control can be achieved using the following methods.

Economic (maximum) stock level

This is the stock level that permits activities to continue without interruption but incurs the minimum cost for the company.

Example

To ensure that production continues without interruption for a 20-day period where 100 units are used daily, the economic stock level (ESL) would be:

$$\begin{aligned}\text{ESL} &= 20 \text{ days} \times 100 \text{ units} \\ &= 2000 \text{ units}\end{aligned}$$

Minimum stock level

This is the stock level that ensures that there will always be stock for production, allowing for ordering and delivery times.

Example

Usage = 100 units per day

Lead time = 5 days

Add a reserve of 3 days' stock to cover for unforeseen delays, weekends, etc.

$$\begin{aligned}\text{Minimum stock level (MSL)} &= 5 + 3 \text{ days} \times 100 \text{ units} \\ &= 800 \text{ units}\end{aligned}$$

Re-order level

This is the level at which new stock should be ordered. Usually calculated on the basis of usage per day, minimum stocks held + lead time (delivery time for new stock).

Example

Minimum stock level = 800 units

Lead time = 5 days

Average usage = 100 units per day

$$\begin{aligned}\text{Re-order level (ROL)} &= \text{minimum stock} + \text{lead time} \\ &= 800 \text{ units} + (100 \text{ units} \times 5 \text{ days}) \\ &= 800 + 500 \\ &= 1300 \text{ units}\end{aligned}$$

Re-order quantity

This is the amount of stock required to return stock levels to economic (maximum) stock level on the same day that new stocks are received. Normally the re-order quantity is automatically ordered as soon as the re-order level is reached. The quantity re-ordered should return the stock levels to that of the economic stock level.

Example

Economic stock level = 2000 units

Minimum stock level = 800 units

$$\begin{aligned}\text{Re-order quantity (ROQ)} &= \text{ESL} - \text{MSL} \\ &= 2000 - 800 \text{ units} \\ &= 1200 \text{ units}\end{aligned}$$

Once these levels are set and agreed, the correct amount of stock should always be available to maintain continuous production.

Traditionally, there are two ways of storing stocks, either in one central area (centralised storage) or in different locations throughout the organisation depending on where the items are to be used (decentralised storage).

Centralised storage	
Advantages	Disadvantages
<ul style="list-style-type: none"> • More cost-effective than maintaining many small storage areas • Supervised by specialist staff • Agreed procedures for issue/receipt • Agreed procedures for ordering • Bulk ordering/storage may be cheaper • Increased efficiency in distribution 	<ul style="list-style-type: none"> • Time wasted going to and from stores • Cost of specialist staff • Cost of dedicated storage area

Decentralised storage	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Stock always available • Orders of stock will reflect actual usage • Faster turnover of smaller amounts of stock reduces likelihood of deterioration/decay 	<ul style="list-style-type: none"> • Less rigid control – theft and loss more likely • Takes up space in production areas

Just-in-time stock control

A just-in-time (JIT) system aims to get the highest volume of output at the lowest unit cost. It is really a method of *production control*. Using a 'pull through' approach the advantages claimed for this system include:

- a smoothing out of production flows
- a reduction in stock levels
- a reduction in unit costs of production
- much easier production planning for management
- ease in meeting delivery deadlines
- elimination of waste
- no over-production.

The concept is very simple. If there is no demand for the product there is no production. It is the anticipated or planned consumer demand – often initiated by the sales or marketing department – that triggers the production process. Finished goods are produced **just in time** to be sold to the customer. Component parts are assembled **just in time** to become finished goods. Materials are purchased **just in time** to make component parts.

Just in time	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Improves cash flow since money is not tied up in stock • Reduces storage costs, for example space, equipment and staff • Reduces waste, obsolete and damaged stock • More factory space is made available for productive use • Less vulnerable to fashion changes • Links with and the control of suppliers are improved • Supplier base is significantly reduced • More scope for integration within the factory's computer system • Motivation of workers is improved as they are given more responsibility and encouraged to work in teams 	<ul style="list-style-type: none"> • A lot of faith is placed in the reliability and flexibility of suppliers • Increased ordering and administration costs • No time for quality control when material arrives • Advantages of bulk buying may be lost • Vulnerable to a break in supply and machinery breakdowns • Difficult to cope with sharp increases in demand • Possible loss of reputation if customers are let down by late deliveries

Each system of stock control has both advantages and disadvantages and, as with all management decisions, each business must choose the system most appropriate to its needs.

Warehousing of stock

Despite the efforts of management to relate the production output of a product to its forecast sales figure, under normal circumstances it is impossible to match output to demand exactly. At different times, sales will exceed the forecast or fall below it.

However, since sales occur after the finished product is produced; any response to changes in sales tends to be too late to influence output.

Consequently, it is necessary to store stocks of finished goods in a location that offers security and a suitable environment, this will depend on:

- type of stock, for example perishable
- finance available for storage
- number, size and location of customers.

Most production units store finished goods in warehouses that may be centrally situated or decentralised. The main aspects of warehouse planning and organisation are as follows.

Design and layout

The design and layout of the warehouse is of major importance if stock is to be handled efficiently. Ideally, the warehouse should be on ground level only as this speeds up handling time. Those goods that are moved most frequently should be located in a readily accessible area and a stock rotation system should operate to avoid deterioration in quality.

Mechanical handling

Although specialist stock-handling equipment can be very costly to purchase, the benefits from its use can be substantial in terms of use of space, the time required to 'move' stocks and costs.

Pallets offer benefits in that they are easily moved with the aid of a forklift truck and help to avoid deterioration by keeping items off the floor.

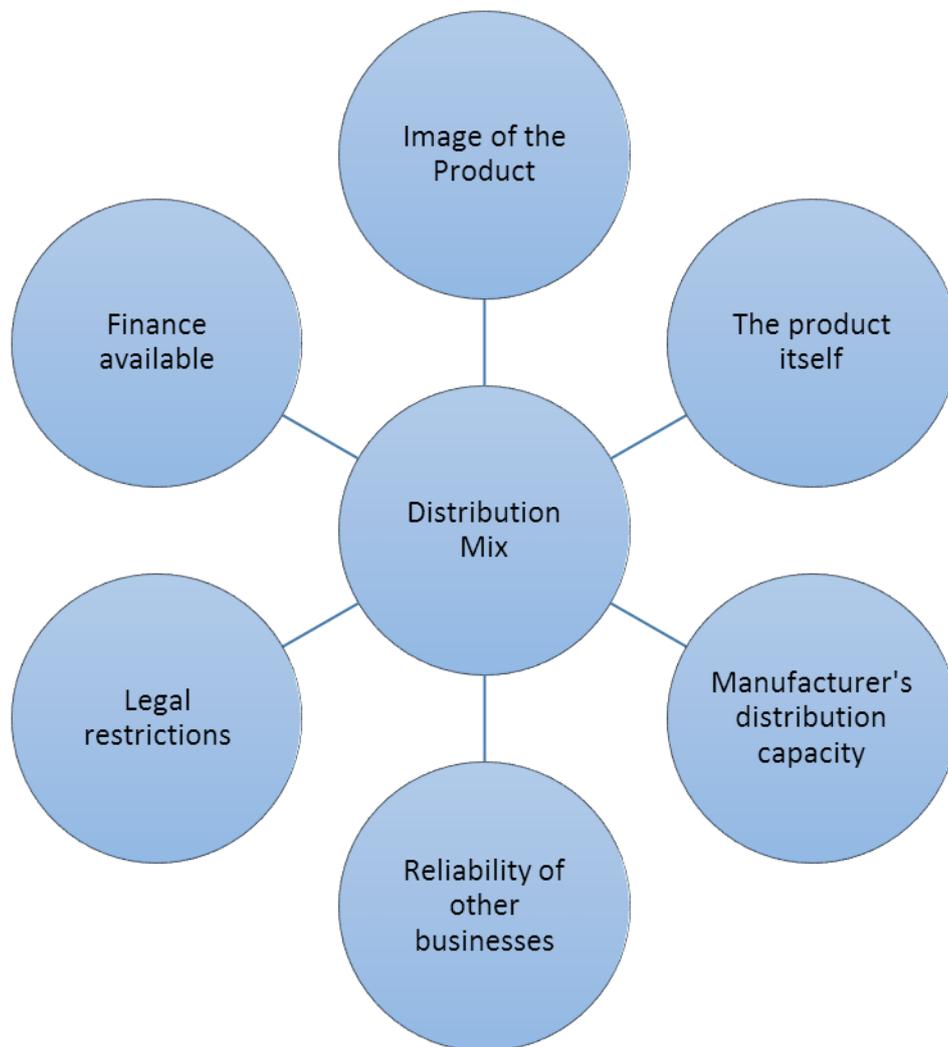
Transportation

A business may own or hire transport or use public transport. It is essential for a business to consider carefully its needs prior to determining its transportation policy. Owning its own transport offers an organisation complete control of its vehicles and drivers, but incurs high capital and running costs, and requires careful route planning if under- or over-utilisation is to be avoided.

Reliance on outside transport avoids any capital outlay and offers the potential for increasing or reducing transport requirements at short notice (hence saving costs), but control of the system and reliability may be reduced.

Distribution/logistical management of stock

When transporting goods, a business must consider a number of factors, known as the distribution mix:



Products can be distributed via:

- road
- rail
- air
- sea.

In the UK over 80% of all goods are delivered by road. Motorways make it easy to deliver raw materials, component parts and finished goods from door to door, even in the most remote locations. Until recently, the great majority of freight going to the continent also went by road transport, although the railways have increased their levels of freight carrying since the opening of the channel tunnel. Improved transport links have given organisations much more freedom in decision-making about the location of factories, offices and retail outlets.

A business will have to assess the costs and benefits of each method of transport. If you have to deliver fresh strawberries at Wimbledon each morning, and the strawberries are being picked in Blairgowrie, the most appropriate method would be refrigerated airfreight – despite its high cost. If a business is transporting fish from Peterhead to the London fish markets, the most cost-effective method is refrigerated lorry.

Scheduling

Scheduling is a plan of how the business will ensure the entire production process, from ordering of raw materials to the final delivery to the customer, operates smoothly.

It doesn't matter what goods you are producing or what service you are offering to your customers, it is essential that all of the factors of production and distribution are working in a co-ordinated fashion.

The bringing together of raw materials, components, workers, machinery, transport systems and sales outlets has to be organised in such a way as to make sure that the work flows through the stages of production.

Delays and redundant resources should be avoided. This means that the operations function of an organisation, be it in manufacturing or service industries, a multinational corporation or a sole trader business, will have a central role to play and will have to maintain close relationships with other departments.

4 Methods of ensuring that customers receive quality products.

Quality

In today's highly competitive global market quality has become one of the key decision areas in operations. Quality is an extremely difficult term to define as it can mean different things to different people.

What is quality?

- Quality is about getting things right first time.
- Quality is about taking pride in what you do.
- Everyone benefits when quality is high.
- Effective quality must be based on prevention and not detection.
- Quality is whatever the customer needs (high quality at a competitive price).

From the consumer's point of view quality may be:

- quantity provided for the price paid
- the reliability or lifetime of the product
- the extent to which the product or service satisfies a customer's particular requirements, for example technical features, appearance and how well the product/service compares with its marketing description.

From the manufacturer's point of view, quality may be:

- meeting exact specifications
- a highly skilled workforce
- no customer complaints.

Quality control

Quality control is historic and reactive as product quality is checked at the end of the manufacturing process. Quality controllers will check every product, samples from every batch or random samples depending on the product being produced to ensure that the business has achieved the quality standard it has set for itself.

Quality control involves setting standards about how much variation is acceptable. The aim is to ensure that a product is manufactured, or a service is provided, to meet the specifications that ensure customer needs are met. Consequently, this method often leads to high levels of waste and the scrapping and/or reworking of products.

An example of a quality control system is that found at Kellogg's, where samples of breakfast cereal are removed from the production line every half-hour, around 50 samples per day, and tested for quality. The cereals are graded from 1 to 10 by a small group of trained staff. A grade of 10 is perfect. A grade between 9.8 and 7 means that there is no visible reduction in quality as far as the customer would notice. The cereals all also undergo a series of other tests looking at nutritional values, texture, taste, colour, etc.

Advantages	Disadvantages
<ul style="list-style-type: none"> • Prevents defective products reaching the customer • Trained inspectors are better placed to have an overview of issues that can result in substandard products being produced 	<ul style="list-style-type: none"> • The cost of rejected or reworked products will adversely affect company profits • Individuals are not responsible for their own work as they know it will be checked, leading to 'Friday afternoon car syndrome'

Quality assurance

This method is based on the premise that **prevention is better than cure**. The aim is to achieve quality by **organising every process** to get the **product right first time every time** and prevent mistakes ever happening. Quality standards are **determined in advance**, which minimises the risk of error or non-conformity to specifications.

Quality is **checked at every stage** of the manufacturing process and has been proven to **reduce wastage and scrap to 5% or less**. Consequently, in most businesses quality assurance has replaced quality control.

Advantages of quality assurance

- ✓ Costs are reduced because there is less wastage and re-working of faulty products as the product is checked at every stage.
- ✓ Improves profitability.
- ✓ It can help improve worker motivation as workers have more ownership and recognition for their work.
- ✓ It can help break down 'them and us' barriers between workers and managers as it eliminates the feeling of being checked up on.
- ✓ With all staff responsible for quality, this can help the firm gain marketing advantages arising from its consistent level of quality.

Disadvantages of Quality Assurance

- × Requires a change in organisation culture, which could be resisted by staff.
- × Cost of implementation, for example training costs or new equipment.
- × Creativity and innovation are discouraged due to the need for standardisation and consistency.
- × Full implementation can take a period of years and required perseverance, patience and motivation.

Total quality management

TQM is a specific approach to quality assurance and aims to develop a quality culture throughout the business. TQM focuses on producing a perfect product or service every time in order to meet customer requirements.

TQM uses the principles of quality assurance but takes a fundamentally different view of quality. The principle on which this system operates is that in order to achieve quality, the requirements, specifications, and needs of the customer or client come above everything else. The culture shift must be made from 'we know what quality is' to 'you tell us what you want and that will be our definition of quality'.

In practical terms, TQM assumes that the next person with 'ownership' of the good, or the next person to use the good, is a customer or client – not simply the person who ends up purchasing the good for his/her own use.

Quality is therefore essential at each and every step in the production of a good or, for that matter, in the provision of a service, to which the same principles apply.

For example, on the production line in a factory, the next person down the line from you is your customer or client. You must therefore ensure that when the part-assembled car leaves you to move on to the next worker any work you have done on it is of the highest standard and quality – just as you will expect to receive the car parts from the worker in front of you.

It is felt that although it is initially costly to establish, TQM can achieve savings in the long run by reducing wastage to around 3%. This can make a considerable difference to an organisation.

For TQM to be successful it requires:

- the understanding that this is a core corporate philosophy focusing on the needs of the consumer
- a commitment by top management and therefore the provision of the necessary resources
- that every member of the organisation, for example cleaners, receptionist and top management, is consulted and involved in setting standards
- a focus on teamwork and creative thinking to identify future improvements
- to be viewed as a long-term concept
- a quality plan to be established that offers a structured, disciplined approach to quality
- emphasis to be placed on the collection and analysis of information
- employee training to be treated as essential
- a constant checking of performance (quality standards) by individuals
- a constant search for improvement
- focus on the total quality of output, in which case the cost savings can be considerable.



Advantages of TQM

- ✓ Reduction or elimination of defective products and waste.
- ✓ Improved cost management.
- ✓ Increased profitability.
- ✓ Improved customer focus and satisfaction.
- ✓ Increased customer loyalty and retention.
- ✓ Improved employee morale.
- ✓ Strengthen competitive position.

Disadvantages of TQM

- × Requires a change in organisation culture, which could be resisted by staff.
- × Cost of implementation, for example training costs or new equipment.
- × Creativity and innovation are discouraged due to the need for standardisation and consistency.
- × Full implementation can take a period of years and required perseverance, patience and motivation.
- × Can result in job losses.

TQM and quality assurance require four elements to be implemented and managed.

1 The definition of 'quality' at each stage of the process

Ultimately this lies with the customer in terms of defining a specification of the desired product/service and may include specific reference to, for example:

- intended usage
- required outcomes
- standards of safety
- efficiency
- quality of the finished product
- cost.

It is up to the supplier to clarify the customer's definition and confirm their ability to supply to these requirements.

Suppliers must take responsibility for helping their customers to articulate precise requirements. Vague definitions of ideas will be impossible to implement as these lead to misunderstandings and errors that, by the nature of the system, must be eradicated.

Only if instructions are specific at every stage of the process can quality be assured, and for this specifications must also be precise.

2 The commitment of all

- A clear commitment to quality in the mission statement of the organisation.
- A quality manual/handbook that outlines the specific components of each job within the organisation.
- A clear definition of the responsibility of every individual within the organisation to deliver quality on every occasion to every customer.
- The drawing up and implementation of a 'contract' to confirm the mutual obligation of the supplier and the customer.
- The establishment of standard operating procedures (schemes of work, checking procedures, etc) to help ensure consistency.
- The use of quality audits to establish the integrity of provision against the set specifications.
- The use of quality circles.
- The use of benchmarking.

3 A system in which this standard of quality can be assured

Effective management for quality assurance will require organisations to set up systems and processes that will include:

- systems to help in the definition and specification of products/services
- systems for checking and monitoring the process and quality at all stages in production/provision
- using appropriate documentation to set out requirements and to record progress and quality achieved
- keeping records
- designating individual responsibility for ensuring quality throughout the organisation
- reviewing, monitoring and feedback from operatives
- staff appraisal
- settings of specific targets of achievement
- providing comprehensive job descriptions
- providing comprehensive and clearly understood instructions and information at all times.

4 A measure of the ability to meet quality requirements

This can be carried out in a number of ways, both qualitatively and quantitatively. It may be made on customers' perceptions/satisfaction or on objective measurements – both are valid indicators of conformity.

Quality standards

From much that we read about recent business organisations and their operations, we might think that the concept of quality has dominated the thoughts of all management teams, regardless of the type or size of the organisation. From schools finding themselves on league tables and GPs' surgeries having to fulfil a Patient's Charter in their performance, to all types of consumer goods being branded as 'quality' products, all producers and service providers seem to be involved with TQM.

The traditional view of quality is that there is some conformity in specifications of standards. However, modern thinking now broadens this view to emphasise the importance of the perspective of the customer in the setting of quality definitions. In this way, quality is seen more as fitness for purpose or intended use. This might include measures of appearance, safety, availability, value for money, ease of use, consumer after-sales support, the reputation of the product and the organisation, and even the way staff deal with customers.

In recent years the government, through the British Standards Institute, has defined quality assurance as an all-embracing concept involving all stages and all people in the production process. This is a significant move away from the previously held notion of quality control, where the emphasis was on detection and the remedial treatment of faults.



The government further pushes organisations to adopt quality standards such as BS5750 by stating that they will only award contracts to those organisations that hold the certificate.

There has to be general agreement within the organisation about the quality standards that it is to aim for in its operations. Quality manuals have to set out policy and procedures on quality assurance and identify the quality standards set down by the organisation. Inspections will be made into current procedures and working practices to ensure that what is laid down in the manual is being put into practice. If these are of a sufficiently high standard there is a recognised quality standard award certificate that can be made to manufacturing industries, allowing them to incorporate the standard into their marketing literature.

British Standard 5750 is the standard that has been developed as a benchmark for quality in the UK. Consequently BS5750 and its international equivalent, the International Organisation for Standardisation's ISO9000, are recognised as the mark of quality in over 90 countries worldwide. Other award schemes also exist whereby TQM can be recognised, for example the European Foundation for Quality Management (EFQM).

Other organisations award their own quality assurance marks. These include the British Standards Institution Kite Mark, the Association of British Travel Agents (ABTA) symbol and the pure new wool symbol of the Wool Marketing Board.

Investors in People (IIP) is another recognised quality standard that can be achieved by organisations that provide training and other development opportunities for all staff.

The business benefits from achieving these standards in the following ways:

- improved health and safety in the workplace
- improvements in operations processes, for example quality checks, reduced wastage
- improved morale of workforce as a result of better working conditions and job satisfaction
- possible increase in profits and/or market share
- competitive advantage.

Consumers benefit by receiving products that are:

- conforming to the requirements
- dependable and reliable
- safe to use.

There is a cost attached to achieving these standards, but it is outweighed by the benefits this recognition brings to the business.

Benchmarking

Benchmarking is an approach to business improvement based on identifying best practice in the industry to set performance standards against which work can be measured. The objective of benchmarking is to understand and evaluate the current position of a business in relation to best practice, to identify where it falls short of current best practice and to determine what action is needed to either match or exceed best practice. Done properly, benchmarking can provide useful quality improvement targets and result in the business having a lead edge over competitors.

Application of benchmarking involves four key steps:

1. Understand in detail the existing business processes.
2. Analyse the business processes of others.
3. Compare own business performance with that of others analysed.
4. Implement the changes necessary to close the performance gap.

Benchmarking should not be considered a one-off exercise. To be effective, it must become an ongoing, integral part of an ongoing improvement process, with the goal of keeping abreast of ever-improving best practice.

This can be a helpful approach for services as well as for products, for example a fast-food business selling fish and chips could decide that it wanted to aim to equal McDonald's speed of meeting customer orders for takeaway food. A financial services firm might want its call centre staff to answer 95% of telephone calls within six rings, if this is the practice of the best in the industry.

Businesses can also use internal benchmarking in which best practice may be set with reference to another department or by a similar factory/shop in a different location.

Advantages of benchmarking

- ✓ Supports a culture of continuous improvement.
- ✓ New ideas and perspectives are introduced into the business from external sources.
- ✓ Provides a focus for change using evidence gathered from competitors.
- ✓ Can lead to a competitive advantage.

Disadvantages of benchmarking

- × Market leaders may resist making information available publicly to competitors.
- × Benchmarking is an ongoing process. A business cannot become complacent or competitors will match or overtake their standard and position in the market.
- × Benchmarking must be accompanied by a plan of change, which will require significant time and resources.

Quality circles

A quality circle is a group of employees and managers that meets regularly to identify and resolve problems about quality in the production process. Their remit includes the consideration and recommendation of suitable alternative practices relating to issues such as quality improvement, cost reduction, health and safety in the production process, and improving efficiency, which are then put to management.

The members of the quality circle will largely consist of shop-floor workers, but may also include engineers, quality inspectors and members of the sales team who represent the customer's perspective.

The idea of quality circles originated in Japan, with Toyota Motor Company establishing the first quality circle in the 1950s. It is based on two key principles:

- No-one in the production process knows more about the problems that might arise than the shop-floor workers.
- Workers will appreciate and be motivated by the opportunity to use their knowledge and skills alongside management in a problem-solving environment.

When quality circles are introduced the business aims to achieve the following:

- **change in attitude:** from 'I don't care' to 'I do care', leading to an improvement in quality as individuals take ownership of their work
- **professional development of staff:** staff can learn new knowledge and skills and demonstrate their previously hidden potential
- **improvement in team spirit:** recognition that the quality circle can achieve more than the individuals involved and can also break down departmental barriers
- **improvement in organisational culture:** a more positive and inclusive work environment increases motivation and morale
- **improved quality and productivity:** changes discussed and agreed in the quality circle should lead to the quality of the end product improving and the removal of inefficiencies in the production process.



Advantages of quality circles

- ✓ Employees become more productive as they are given the opportunity to discuss issues and offer solutions, which increases motivation and enthusiasm.
- ✓ Improve quality of product and reduce costs due to less wastage.
- ✓ Opportunity for professional development is motivational for staff.
- ✓ There is no additional cost to implementing them as staff are already paid by the business.
- ✓ Increases job satisfaction for employees, which can lead to loyalty to the business and reduced staff turnover.
- ✓ Communication between managers improves and can prevent a ‘them and us’ culture.

Disadvantages of quality circles:

- × They can identify appropriate solutions to problems but senior management may fail to implement them.
- × Participants may not be adequately trained in problem-solving and team work.
- × Without proper leadership the meetings could degenerate into discussions about grievances and personal issues without solutions to being offered.
- × Middle-level managers or supervisors may feel that their position is undermined by giving shop-floor workers a direct link to senior management.

Mystery shopping

Mystery shopping is the practice of using **trained shoppers** to anonymously evaluate:

- customer experience
- operational efficiency
- employee integrity
- use of merchandising
- service/product quality.

Customer service is often the key to the ongoing success or failure of a business. It is more cost-effective to retain an existing customer than to attract a new one, therefore making sure customers receive the appropriate level of service is a good investment.

Benefits to the business

- ✓ Feedback is received that can be used to improve processes.
- ✓ Training needs can be identified.
- ✓ Improves customer retention.
- ✓ Monitors quality of products and service.
- ✓ Improves employee awareness of the importance of customer service.
- ✓ Reinforces positive action by offering an incentive-based reward system to employees and managers.

Costs to the Business

- Expensive form of market research
- Only gives a snapshot of the service
- Mystery shoppers may include bias towards the organisation or person in their feedback



Ethical operations

Working ethically means **doing the right thing** and acting in a way that is **both fair and honest to all stakeholders**. Ethical decisions will take into account:



- **impact** – who will be affected by the decision?
- **fairness** – will those who are affected by the decision consider it to be fair?

Behaving ethically is not quite the same as behaving lawfully:

- **ethics** are about what is morally right and what is morally wrong
- **law** is about what is lawful and what is unlawful.

An ethical decision is one that **is both legal** and meets the **ethical standards of the stakeholders**.

Henry Ford, who founded the Ford Motor Company, said in 1903:

‘A business that makes nothing but money is a poor business.’

He was referring to the responsibility of businesses not only to create good products for their customers, but also to share good practice and goodwill with all of their stakeholders.

Within the operations function of a business one of the key decisions is which supplier to use. A business can only claim to operate ethically if its suppliers are also ethical.

Unethical practices of suppliers can include:

- the use of child labour
- the use of sweatshops for production, for example hot conditions, long working hours
- the violation of workers’ rights
- the violation of health and safety standards.

The organisation should provide all stakeholders with their standards in an Ethical Code.

Advantages	Disadvantages
Increased sales revenue as demand from ethically motivated consumers grows	Cost of sourcing ethical labour and materials can be high
Improved business image, leading to increased brand awareness	Higher overheads, for example training staff to ensure adherence to ethical policy
Easier access to sources of finance, eg ethical investors	Ethical standards vary between countries, which can be problematic for multinational corporations
Improved employee motivation and recruitment	Higher price therefore less competitive

Fairtrade

Fairtrade is about achieving better prices and fair terms of trade for farmers in the developing world, who may have been exploited by greedy purchasers who may not pass on profits. Farmers pay their workers a fair wage, health and safety improves, and the local community becomes more sustainable. Fairtrade also ensures that the economic benefits are shared with the workers and farmers, not just the shareholders of the business.

The not-for-profit organisation Fairtrade International (www.fairtrade.org.uk), awards the Fairtrade Mark for products that meet its strict criteria. It can be seen on food products such as coffee, chocolate, bananas and sugar in addition to non-food products such as cotton.

Larger companies such as Starbucks and Cadbury have joined the fairtrade movement in recent years as they believe that the process strengthens the producers' position in the market place as well as reassuring ethically motivated consumers.



A business benefits in many ways by being part of Fairtrade:

- **diverse market place** as demand for consumer goods is increasing as more market segments demand ethically sourced products. The UK market for Fairtrade goods is doubling in size approximately every 2 years. Social demand means that there has been an increase in consumers wanting ethical products. If a business does not produce or sell Fairtrade products it excludes a significant number of consumers from the market place.
- **increased customer loyalty** as commitment to Fairtrade could increase customer retention, giving the business more stability.
- **a good public image**, as being seen as ethically minded will encourage consumers to choose a business over competitors who do not offer ethically sourced products. This could result in increased sales and profitability for the business. A survey by Free Poll found that 96% of consumers are prepared to spend extra on products if they perceive them to be more ethically produced.
- **recruitment of staff and volunteers** will be easier as a Fairtrade business will be viewed as being caring and ethical – staff and volunteers are likely to have the same ethical stance and retention may also increase.

However, there are also some drawbacks for the business:

- **the price is higher for the consumer** compared to non-Fairtrade products, which can be viewed unfavourably by some consumers
- **small-scale production** is promoted by Fairtrade, but economies of scale cannot be achieved and it is more difficult to control production methods and prices. These factors can deter large businesses from working with these farmers.
- **tariffs** are much lower for non-processed supplies so it may not be profitable for the business to import, for example, roasted coffee instead of coffee beans.
- **concern over climate change and food miles** has resulted in some businesses and consumers weighing up the benefits of Fairtrade with the cost to the environment of transporting the goods.

Environmental responsibility

Environmental responsibility refers to the duty that a company has to operate in a way that protects the environment.

Businesses are under increasing pressure to show environmental responsibility not only because it is viewed as being ethically correct but because it is also required by law.

Legislation is in place to control factors such as:

- emissions into the air
- storage and disposal of waste
- emissions into the water supply
- causes of nuisance, for example noise, smoke, fumes, gases, odour, light pollution and accumulation of rubbish.

If a business causes damage to the environment it has a legal obligation to take action to repair the damage.

Complying with legislation and operating in an ethical manner can have many **benefits** for a business.



- reducing energy use can reduce running costs
- reducing the amount of raw materials used can reduce production costs and minimise the cost of waste disposal
- income may be generated from recycling equipment and materials, and saving can be made on the cost of disposing these items
- taking preventative measures to avoid environmental damage can be more cost-effective than incurring the expense of cleaning up once damage has been done or paying fines imposed.
- many government organisations will only work with a business that takes environmental responsibility seriously
- many investors will only invest their funds with an environmentally responsible business
- it can be easier to attract investment from banks
- it enhances a business's reputation and can improve customer loyalty.

Costs

Cost of disposing of waste
Higher overheads, for example training staff to ensure adherence to environmental policy
Costs of recycling
Costs of changing machinery to lower emissions/energy use
Costs of reducing pollution eg noise, light

Profit maximisation will always be the primary objective of a **business in the private sector**, but many businesses are now realising that **acting in an environmentally responsible way** can **improve their profitability** and the **long-term success of the business**.