

Methods of Production

UNIT
3.2

Every business will research the quickest, most efficient and the most profitable way in which to manufacture its product.

There are four methods of production, and the method chosen by any business depends very much on the type of product being made, and on the quantity which is required

Although we shall study each of these methods separately, it should be understood that, in practice, very often a business may use a combination of the methods for some of its work.



Main Methods of Production and Their Use in Particular Circumstances

Job production

Joan Johnston is a talented dress designer in Ballynahinch who especially enjoys designing and making wedding dresses. She works alone in a large room at the back of her house. Although her dresses are expensive, they are in great demand because they are expertly handmade and unique. Each girl comes to her with a vague idea of the design of the wedding dress she would like, and Joan draws the final design and makes the dress to suit the customer's individual requirements.

Joan gets tremendous job satisfaction from her work, and produces only one dress at a time so that it gets her full attention. Very often, she changes little details of the dress during its production because the customer sometimes changes her mind. Joan is happy to do this because she wants the customer to be really pleased with the dress which is a 'one-off' and individually produced for her.

Joan Johnston's work is a good example of job production.

Job production is where one single item is made at a time and is often produced to the customer's individual specification. Each product is unique and a long time would usually have been spent on it. For this reason, goods produced by this method are expensive to buy.

Job production would not be suitable for factories but would be found in craft shops where emphasis is placed on the hand-made, interesting and individual character of the product.

Examples of goods made by the job production method are:

- craft goods
- luxury cars

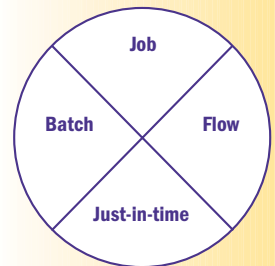


Figure 3.2

- designer clothes
- double glazing
- stained glass windows
- landscape gardening
- house plans
- antique furniture.

The **advantages** of job production are:

- each piece is made to the customer's exact requirements
- job satisfaction is high for the worker
- quality of the goods is very high
- the design is flexible and can be changed.

The **disadvantages** of job production are:

- the products are very expensive
- the work is very time consuming
- the advantages of economies of scale are lost.

Batch production



Cupid's is a shop in Ballynahinch which sells wedding dresses. The Sales Manager, Margaret Wilson, has been looking at the wedding photographs in the local newspapers. She has been very impressed with the dresses which the newspaper reports of the weddings say were made by Joan Johnston.

Margaret approaches Joan and asks her to make 10 dresses – all the same design, but in different sizes – for sale in Cupid's. She promises that another order will follow for 10 dresses of a different style.

Joan agrees with this arrangement and has to employ two temporary dressmakers, Hazel and Joyce, to help with the additional work.

Joan has now moved into batch production.

Batch production is used where several of the same product are made in a batch. When the first batch is completed, production continues with a number of a second product,

and so on. All the items made in a batch are the same, so production is speeded up. This reduces the cost of labour and results in the final product being less expensive for the customer.

Batch production would be suitable for businesses such as bakeries which bake a number of the same loaves and cakes every day, and where the products do not have to be individual. Newspapers are also produced by this method. The papers are printed every day and each batch must meet a deadline.

Examples of goods made by the batch production method are:

- newspapers
- bread
- clothing
- furniture
- motor car components
- books
- building of housing estates where all the houses are the same.



Figure 3.3
*These houses are all identical
– an example of batch
production*

The **advantages** of batch production are:

- workers may specialise to some degree
- labour costs are reduced so the final price is lower
- machinery may be used
- production is faster
- begins to take advantage of economies of scale.

The **disadvantages** of batch production are:

- the work is less interesting than in job production and is repetitive
- more space is required for working and storage
- larger stocks of raw materials must be kept
- machines may have to be re-set between batches, which loses time.

Flow production

Other shop managers in Cookstown, Ballyclare, Newcastle and Maghera have been contacting Joan Johnston to ask if she would supply wedding dresses for their shops.

Joan is certainly interested in this extra work but realises that her production method would have to change. She rents larger premises, buys additional sewing machines, makes Hazel and Joyce permanent, and employs three additional people – Evelyn, Robert and Mervyn. Joan names the business ‘Wedding Belles’.

Joan organises the operation on an assembly line basis and each of the six people working in the business is responsible for his/her own separate part of the production of the wedding dresses.

Although her profits are higher, Joan regrets the fact that the larger number of dresses she now produces are all the same. She also misses the personal contact with her customers which she once enjoyed.

Joan has now moved into flow production.



Figure 3.4

Mass-produced goods – made by the flow production method

Flow production is also sometimes known as mass production or assembly line production. It is the method used in factories and most modern production would employ this method.

In flow production, one product is made continuously and in large numbers. A conveyor belt or assembly line is organised and, as the product moves along the line, parts are added to it. In this way, the item starts at the beginning of the line as raw materials and is packaged and ready for sale when it reaches the end of the line.

Operation of an assembly line requires numbers of employees to sit at their particular places and perform their allocated tasks as the product moves along the line. Each employee's task is very repetitive and simple so those engaged in flow production tend to be unskilled or semi-skilled. Motivation of workers is often a problem, and strategies such as job rotation are often used in order to relieve the monotony.

Flow production is suitable for use where large numbers of identical products are being made. This method is very dependent on machinery, therefore a large amount of capital is needed to establish the factory.

However, since large quantities are being produced in the shortest possible time, wages and other costs are kept to a minimum and the finished product is usually not expensive for the customer.

Examples of goods made by the flow production method are:

- motor vehicles
- machinery
- Televisions
- inexpensive clothing
- toys.

The **advantages** of flow production are:

- final product is inexpensive
- large quantities can be manufactured
- the quality of the product is standardised
- machinery can be used so labour costs are reduced
- unskilled wages further reduce costs
- assembly lines can run continuously
- production is fast
- takes full advantage of economies of scale.

The **disadvantages** of flow production are:

- the work is repetitive and boring
- there is an increased risk of accidents

- employee motivation is low
- the products are all identical
- large capital investment is required
- large buildings are usually needed
- large stocks of raw materials must be kept
- machinery breakdown can halt production
- there is a loss of traditional skills.

Just-in-time production

Just-in-time can also be thought of as a method of stock control. The system originated in Japan and is widely used in that country and in Japanese factories in other parts of the world.

Using the just-in-time method:

- products are manufactured just in time for them to be sold. This prevents large stocks of finished goods having to wait to go to market
- the raw materials or parts which are needed for making the final product, are ordered and arrive just in time for use in its manufacture. Large stocks are not held in warehouses waiting to be used.

In this way the just-in-time production method saves money being tied up for long periods in unused stocks of raw materials and unsold finished products. It is therefore effective in reducing costs for the manufacturer.

On the other hand, mistakes in deliveries could hold up production because there are no reserve stocks to go on using.

The **advantages** of just-in-time production are:

- capital is used very effectively
- warehousing is not needed for storage
- if faults occur in supplies, the business does not have a large number of the faulty items
- there is no waste by having excess stocks
- the finished product should be cheaper for the consumer to buy.

The **disadvantages** of just-in-time production are:

- the business is very dependent on having a very efficient ordering system
- production could be halted if the wrong goods were delivered at the last minute
- it puts severe pressure on suppliers
- the company and its suppliers must work together closely.

ACTIVITY

Imagine that you are a Japanese manager of a new car factory being set up in Northern Ireland. You have experience of the just-in-time method of production and you wish to introduce the system into the new factory.

You plan to give a talk to the employees tomorrow to explain the system to them. Using the computer, produce the talk which you have prepared for the meeting.





EXAMINATION QUESTION

Quality Doors Ltd has a factory in Co Fermanagh and is a hi-tech business manufacturing doors for kitchen and bedroom furniture on a large scale. The business has a highly trained workforce and takes pride in using the latest technology.

- a Explain two methods of production which would be suitable for use by Quality Doors Ltd (4 marks)
- b Describe one method of production that this business is unlikely to use. (2 marks)

(CCEA Business Studies, GCSE, Paper 2 Foundation Tier, 2002)

Tips for answering this question:

- a This question is asked in order to find out if you really understand the methods of production. First, you should study the details of Quality Doors Ltd and then choose two methods which would work in this particular business. You should give a short description of both methods, saying why they would be suitable for Quality Doors Ltd.
- b Part B should be treated in the same way as Part A. Choose one method which would definitely not work well in this business and give your reasons.

Specialisation

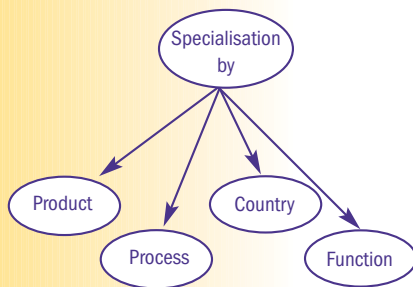
Joan Johnston has had to allocate separate responsibilities to each of her employees in 'Wedding Belles'.

Joan has retained responsibility for all design work. Mervyn is the cutter, and passes on the prepared parts of the dresses to Hazel and Joyce who make them up into dresses on the sewing machines. The dresses are then passed to Evelyn who is responsible for the finishing work of sewing on buttons and decorations and pressing the finished garments. Robert is responsible for packing, labelling and transporting the finished products to the shops. Robert also does all the clerical work.

Joan has now started to use specialisation.

Specialisation occurs when an employee concentrates on one particular operation, and does it all the time. It is where each worker, or group of workers, undertakes only a small section of the total work and specialises in that particular part of making the product.

It also occurs when a country concentrates on producing one particular type of goods. For example, areas of France specialise in making wine because the climate there is suitable for vineyards and wine making.



There are four types of specialisation:

- Product For example, the 'Wedding Belles' business specialises in the product of wedding dresses.
- Process For example, in 'Wedding Belles', Hazel and Joyce have specialised in the process of machining the dresses.
- Function For example, in the 'Wedding Belles' business, Robert has specialised in distribution and clerical work.
- Country For example, France specialises in the production of wine.

Advantages of specialisation

- People can work constantly at jobs which suit their special skills or training. In this way, each person becomes an expert.
- The finished product should be of higher quality because of this expertise.
- Resources can be used effectively and concentrated in one place.

Disadvantages of specialisation

- Specialised workers are trained in only one skill so other work may be difficult to find if they become redundant.
- Any business concentrating on a small range of work becomes very dependent on other businesses.
- An area concentrating on a single industry is very badly affected if that industry should fail. For example, parts of France would suffer greatly if poor weather caused the vines not to grow.

ACTIVITY

If you are a student at a large school you will already be used to specialisation. Your teachers have all specialised in certain subjects which they concentrate on and teach all the time.

- What is the main advantage for you, as a student, of having specialised teachers?
- Which disadvantages, from the teachers' point of view, can you see in specialisation?
- Design a table with two columns, naming the subjects taught in your school and the names of the teachers who specialise in those subjects.



EXAMINATION QUESTION

Cable Electrics is a large manufacturing firm producing televisions and other electrical goods. Increased specialisation has resulted in a rise in output. Productivity has been improved by using new technology.

- What method of production is likely to be used at Cable Electrics?**
(1 mark)
- Apart from increasing output, suggest one other advantage to the firm of using specialisation.**
(2 marks)
- Suggest one disadvantage to the firm of using specialisation.**
(2 marks)

(CCEA Business Studies, GCSE, Paper 2 Foundation Tier, 2000)

Tips for answering this question:

This is a straightforward 'recall of knowledge' question.

- In Part A you are required simply to name the method which would be most appropriate in Cable Electrics. No further explanation is necessary.
- In Part B you need to state, and briefly describe, one advantage of specialisation. Make sure that it is an advantage taken from the firm's point of view.
- In Part C you should name and briefly explain one disadvantage of specialisation – again taken from the firm's point of view.

Division of labour

Flow production usually leads to division of labour which is a particular type of specialisation. In division of labour, the manufacture of the product is divided into a number of small stages and each employee is given a single task which may be very narrow.



I once visited a toy factory which used the practice of division of labour. I stood behind a girl whose job was to attach the heads to the bodies of dolls as they moved along the conveyor belt. That was the task which she was given, and she spent the entire day lifting a doll's head from a box with her right hand, lifting the doll's body from the conveyor belt with her left hand and attaching the two in the time the belt had halted in front of her.

Advantages of division of labour

- Each worker becomes very practised at one particular task.
- Workers have to be trained for only one small task so lengthy training is avoided.
- The work is faster so the costs per unit of production are reduced.
- Reduced costs can be reflected in lower prices to the consumer.
- Lower prices will raise sales and profits.
- Time is saved because workers do not have to move between jobs.
- Tools and machinery are used economically because each worker will need only the tools which are required for one particular function.

Disadvantages of division of labour

- The work can be very monotonous and boring.
- Bored workers can cause accidents.
- It is difficult for workers to have pride in their work since they do not see the finished product.
- Delays or strikes in one section can cause stoppages throughout the production process.
- There is a loss of traditional skills.
- Goods produced by this method lack variety.
- Workers can feel isolated from each other.
- Redundant employees would have difficulty in finding other work because they are very narrowly trained.

ACTIVITY

You are the manager of a factory which makes television sets. The workers complain of boredom and you have observed that they seem to be very disinterested in their work and half asleep most of the time.

Suggest ways in which you could lessen the boredom and motivate the workers.

The Impact of Technology on Production

Modern technology has been the cause of the greatest changes in modern production and businesses invest large amounts of capital in technology in order to become more successful.

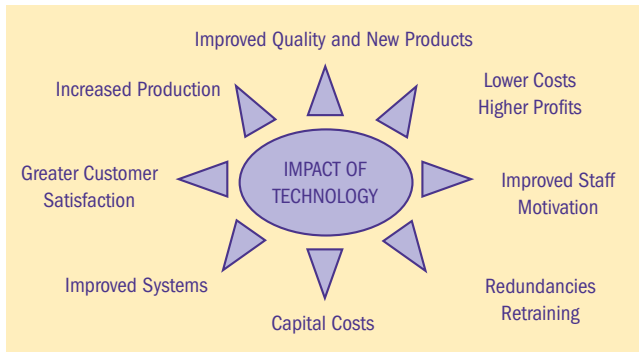


Figure 3.5

The major impacts of technology on production are:

- 1 An improvement of the quality of the finished product**
As a result of the use of technology, the quality of the products is standardised and the possibility of human error is minimised.
- 2 The development of new products**
Improved methods of research and development would lead to new products being added to the business's range.
- 3 An increase in the business's production level**
A fully mechanised business can work around the clock with no interruptions. This would have the effect of increasing the level of output.
- 4 A decrease in the production costs per unit**
Increases in production lead to the benefits of economies of scale which reduces overall costs per unit of production.
- 5 Higher profit levels**
Increased production and sales, as well as reduced costs lead to improved profits for the business and improved efficiency overall
- 6 Greater customer satisfaction**
An improvement in the quality of the business's product and the speed of its service would lead to a larger number of satisfied customers. Computers can also monitor stock levels which would result in better customer satisfaction.
- 7 Improved motivation of workers**
Workers enjoy being part of an organisation which is progressive and are also motivated by the opportunities provided in the business. They also benefit from constant training.
- 8 Improved information and communication systems**
Internal and external communications are improved by the installation of the Internet and e-mail systems. Access to information is improved by the provision of computer-based systems using databases and spreadsheets as well as word-processing.
- 9 Possible redundancies of employees**
The increase of automated jobs can cause staff redundancies. Previous skills are no longer required and new ones are needed.

10 Retraining programmes

A programme of continuous training is required to keep employees abreast with the latest developments in technology. This is expensive for the business to sustain.

11 Capital costs

The installation, updating and maintenance of technology requires a substantial capital investment. This costly investment is often impossible for small businesses to fund.

ACTIVITY

Carry out a survey of the impacts which technology has had on the work in your school.

The areas of the school which are most likely to feel the impact of technology would be:

- a The General Office
- b The Principal's and Vice Principal's Offices
- c Some teaching departments such as Business Studies, CDT etc.

If possible, interview the members of staff concerned to find out whether the overall impact of new technology has been advantageous or disadvantageous to their work.

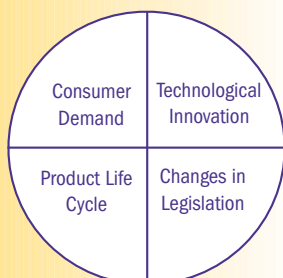
Influences on Product Development

Competition in business is very fierce and businesses need to be constantly either developing new products or modifying existing ones to keep ahead of the competition.

For this reason, businesses spend large amounts annually on the development of new products. It is estimated that, in the year 2000, £13 million was spent in the United Kingdom on research and development of new products.

The normal process of product development goes through several stages. It starts with the generation of a new idea, further studies are done on the idea to see if it is workable and practicable, it is then developed, tested, put into full production and finally launched on the market.

Many ideas are abandoned at an early stage because they may be too expensive, may not be feasible or are too similar to other products on the market.



Four of the influences on product development are:

Consumer demand

Markets change rapidly and the demands of consumers alter as fashions change or according to seasonal changes, for example. Timing is important if the new product is to be successful. It is essential that products are developed and ready for market at the time when consumer demand is at its highest.

Businesses carry out exhaustive market research to discover the needs of consumers in order to develop a product which fits those needs as closely as possible and therefore would be successful after it is launched.

Technological innovation

Changes in technology take place on a continuous basis and alter the design and capabilities of products very quickly. Newly developed products are expected to incorporate the latest innovations.

The market for computers is a good example, as is the music industry. Methods of listening to music today bear no similarity to 10 years ago, and the life of a computer is very short because computer users want to have machines which are up to date. For these reasons, product development is greatly influenced by innovations in technology.

Product life cycle

It is important that new products are developed quickly because the life cycle of products in general is getting shorter. Businesses develop new products all the time but special efforts are made to have new products ready for introduction to the market when others have entered the decline stage.

Changes in legislation

New laws also influence the development of products, especially legislation which affects health and safety.

Legislation controls the ingredients which may be used in food products and it also controls the design of toys and children's wear. For example, nightwear must not now be made from inflammable material following several accidents where children's pyjamas caught fire as they played by the fireside. In this case children's wear had to be redesigned in a different material to conform with the new law.

ACTIVITY

Answer the following questions in your notebook.

- a Why is it necessary for businesses to develop new products or modify existing ones?
- b Name the six stages in product development
- c In what way does consumer demand influence product development?
- d What is meant by 'technological innovation'?
- e Why is it important to have a new product developed when others have entered the decline stage of the product life cycle?
- f Give one example of an effect which a change in legislation has had on the development of a product.

REVISION

At this stage you should understand:

- the impact of technology on production
- influences on product development.

At this stage you should understand the following terms:

Job production

Flow production

Batch production

Just-in-time production

Specialisation

Division of labour

As revision, look each one up in the Glossary at the end of the book.