

Production techniques

■ Design and industrial organisation

The competitive nature of the manufacturing industry means that companies are constantly looking for ways to increase the efficiency and productivity of their systems. Three of the most important ways companies can **realise** this are by using standard components, modular systems and different production methods. It is common practice in modern manufacturing for the production of the components that make up a product to be **given** to external companies. The advantage of using **standard components** is that it **speeds up** manufacturing and reduces manufacturing and **maintenance** costs, as the same units can be **purchased** and used all around the world. As the electronics used in products have become more complex, many manufacturers have adopted a modular approach to control systems. **Modular systems** have the following advantages: they allow inputs, processes and outputs to be combined permanently or temporarily, and they make **replacements** and **upgrades** easier, because only the broken/**obsolete** part needs a replacement/upgrade. **Entrepreneurs** need to decide which **production method** is best for them. There are three main production methods used in manufacturing: **one-off**, **batch** and mass production.



• One-off production

Sometimes known as **job production**, this is where a single item is required; for example, a suspension bridge or a custom-made engine for a racing car. The unit cost is high for this method, as the production system needs to be changed for each different unit.

• Batch production

This happens where quantities of an item are sold regularly; for example, a local baker producing many batches of specialist loaves each day for sale in local shops. Batch production will involve producing and storing the components which will make up the end product.

• Mass production

Products that sell in high volume, nationally or internationally, are manufactured on production or **assembly lines**. The initial set-up cost (or capital investment) of mass production is high, **due to** the specialist equipment used – but the cost is **spread across** a very large number of products so the unit cost is low. When a mass-production line runs continuously **round the clock**, it is called continuous flow. The best method of production depends on the type of product being made and the size of the market.

Small firms operating in the service sector, such as plumbers, use one-off production because each customer has individual needs. Batch production is used to meet group orders while flow production is used to mass produce everyday standardized items.

Economies of scale lead to lower unit costs and prices but not many small manufacturers can afford the investment needed to mass produce goods, so they often opt for either batch or one-off production.

assembly line: catena di montaggio

batch: gruppo

due to: dovuto a

entrepreneur: imprenditore

maintenance: manutenzione

one-off: una tantum/esemplare

to purchase: acquistare

replacement: sostituzione

round the clock: 24 ore al giorno

to speed up: velocizzare

to spread across: suddividere

upgrade: aggiornamento

1 Choose the correct option.

- Which best describes 'production'?
 - ☐ The output of business.
 - ☐ The cost of business.
 - ☐ The amount of resources used by the firm.
- What is job production?
 - ☐ When sets of identical items are produced in groups.
 - ☐ When standardised items are produced using assembly lines.
 - ☐ When single items are produced individually.
- What is batch production?
 - ☐ When sets of identical items are produced in groups.
 - ☐ When standardised items are produced using assembly lines.
 - ☐ When single items are produced individually.
- What is flow production?
 - ☐ When sets of identical items are produced in groups.
 - ☐ When standardised items are produced using assembly lines.
 - ☐ When single items are produced individually.
- Which production method is a local electrician most likely to use?
 - ☐ Job.
 - ☐ Batch.
 - ☐ Flow.
- Which of the following is a benefit of mass production?
 - ☐ Handmade products.
 - ☐ Low prices.
 - ☐ Higher unit costs.
- Which of the following types of company are least likely to make use of mass production?
 - ☐ Sole trader.
 - ☐ A public limited company.
 - ☐ A public corporation.



The F-35 Strike Fighter assembly line

2 Answer the questions.

- Why do manufacturing industries constantly look for new production methods?
- What is the advantage of using standard components?
- What are the advantages of modular systems?
- Why is the one-off production an expensive production method?
- When is batch production employed?
- What is meant by mass production?
- How is the high initial investment cost recovered?
- What kind of methods does a carpenter use?
- And a company producing shampoo?
- What does the method of production depend on?