# Operations management

A-Level Business

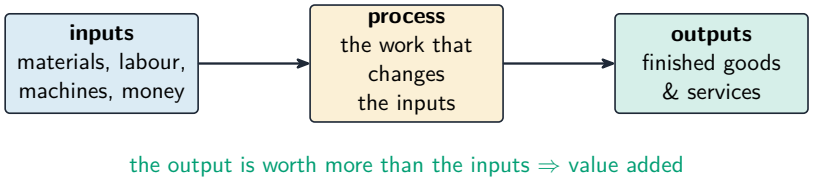
## What operations management does

**Operations** is the part of a business that makes the product. **Operations management** is the job of turning **inputs** into **outputs** well.

*A distribution centre: operations management turns inputs into finished goods ready for customers.*

This is the **transformation process**:

- **inputs** – raw materials, labour, machines and money.
- **process** – the work that changes the inputs.
- **outputs** – finished goods and services for the customer.




*Operations turn inputs into outputs, adding value along the way*

Good operations **add value**: the output is worth more than the inputs used to make it. Using **raw materials** (the basic materials a business starts with) well is a big part of this.

## Productivity and efficiency

**Productivity** measures how much output you get from your inputs:

$$\text{productivity} = \frac{\text{output}}{\text{input used}}$$

**Efficiency** means making products with as little waste of time, materials and money as possible. Higher productivity and efficiency lower the cost of each unit, so the firm can charge less or earn more.

> **Worked example.** A factory of 20 workers makes 800 units in a day. Find the output per worker.

$$\text{productivity} = \frac{800}{20} = 40 \text{ units per worker per day.}$$

If training raised output to 1000 units with the same 20 workers, productivity would rise to 50 units each – the same staff cost now spread over more units, so each unit is cheaper to make.

*Assembly line: productivity is output per worker (or per hour) – rising productivity cuts unit costs*

## Capital- and labour-intensive operations

- a **capital-intensive** operation uses mostly machines (e.g. a car factory). It has high set-up costs but low cost per unit, and is good for large amounts.
- a **labour-intensive** operation uses mostly people (e.g. a hair salon). It is flexible and good for personal service, but quality can vary.

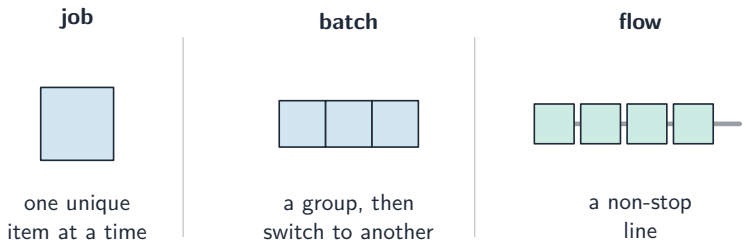
*Factory robots: capital-intensive production uses more machines relative to labour*

## Methods of production

A firm chooses how to organise production to suit its product and demand.

*A car assembly line: flow production of identical units, one stage after another*

| Method | What it is | Best for |
|---|---|---|
| **job production** | making one unique item at a time | a wedding cake, a bridge |
| **batch production** | making a group of the same item, then switching | bread in flavours |
| **flow production** | making items non-stop on a line | bottled drinks, cars |
| **mass customisation** | a flow line that still lets customers choose options | cars with chosen colours |




*The three methods of production*

Job production is flexible but costly per unit. Flow production has a low unit cost but needs high, steady demand.

## Sustainability and technology

**Sustainability** means meeting today's needs without harming the future or the planet. Sustainable operations cut waste, use less energy, recycle, and use materials that can be replaced.

**Technology** is widely used in operations. **Automation** (machines and robots doing tasks) raises output, improves quality and lowers cost, but it has a high set-up cost and can replace jobs.

## Inventory and why it matters

**Inventory** (stock) is the goods a business holds: raw materials, part-finished goods, and finished goods waiting to be sold.

A firm holds inventory so it can keep producing and meet customer orders quickly. But holding inventory has costs:

- **holding costs** – storage, insurance, and money tied up in stock.

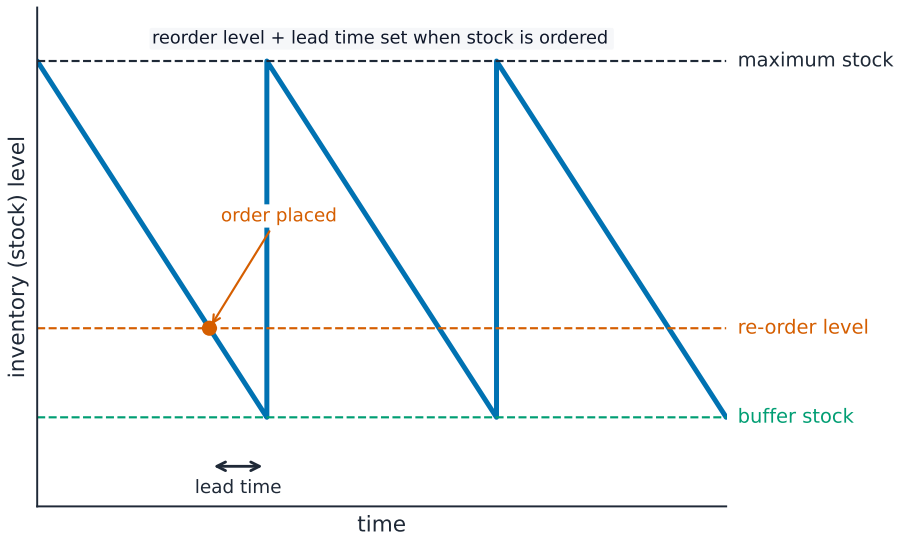
- the risk that goods go out of date or are damaged.

Holding too little stock is also risky: the firm may run out and lose sales.

## Inventory control charts

An **inventory control chart** shows how stock rises when an order arrives and falls as it is used. Key terms:

- **re-order level** – the stock level at which a new order is placed.
- **lead time** – the time between placing an order and receiving it.
- **buffer inventory** – a minimum "safety" stock kept in case of delays or extra demand.
- **maximum inventory** – the most stock the firm wants to hold.

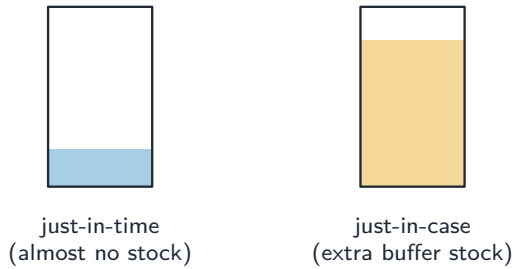



*Stock is used up, then replenished when a new order arrives after the lead time*

## Just-in-time and just-in-case

There are two main ways to manage stock.

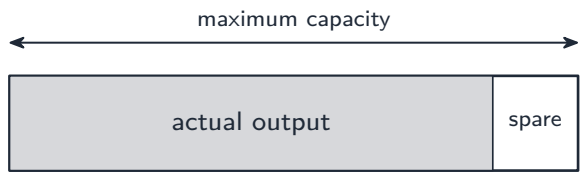
- **just-in-time** (JIT) – stock arrives only as it is needed, so almost no inventory is held. This cuts holding costs and waste, but a late delivery can stop production.
- **just-in-case** – extra stock is held in case of problems. This is safer but costs more to store.




*Just-in-time holds almost no stock (low cost, but risky if a delivery is late); just-in-case keeps a buffer (safer, but more to store)*

## Capacity utilisation

**Capacity** is the most a business can produce with its current resources. **Capacity utilisation** shows how much of that capacity is being used:




*Capacity utilisation: how much of the maximum output is used*

$$\text{capacity utilisation} = \frac{\text{actual output}}{\text{maximum possible output}} \times 100\%$$

- **under-utilisation** (a low figure) means resources sit idle, so the fixed cost spread over each unit is high.
- **over-utilisation** (very close to 100%) leaves no time for repairs, can tire staff, and may lower quality.

Most firms aim for a high but not full level, around 85–90%.

> **Worked example.** A factory can make 5000 units a week but currently makes 4000. Find its capacity utilisation.

$$\text{capacity utilisation} = \frac{4000}{5000} \times 100\% = 80\%.$$

This leaves 20% spare. Winning an order for another 500 units a week would lift utilisation to 90%, spreading the fixed costs over more units without needing new machines.

## Outsourcing

**Outsourcing** means paying another firm (a **supplier** ) to do work the business used to do itself, such as cleaning, IT or making parts.

Benefits: it can be cheaper, lets the firm focus on what it does best, and adds flexibility. Drawbacks: less control over quality, possible delays, and the risk of sharing secrets with another firm.

## Exam tips

- Calculate **capacity utilisation** and **productivity**; high utilisation spreads fixed costs but leaves no slack for breakdowns or new orders.
- Read an **inventory control chart** (re-order level, lead time, buffer stock, maximum stock).
- Compare **JIT vs JIC** (low holding cost but delivery risk vs security of supply but higher cost).
- Match the **production method** (job, batch, flow) to the product and the size of the order.

Vocabulary card meanings

transformation process: Turning inputs such as materials and labour into outputs. mass customisation: Making large numbers of goods that can still be adapted to each buyer. inventory control chart: A diagram that tracks stock against reorder level and buffer stock. capacity utilisation: Current output as a percentage of the maximum output a firm could make. under-utilisation: Using much less of the available capacity than the firm could. over-utilisation: Running above a comfortable level of capacity, which strains staff and machines.