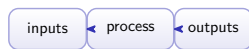


Operations Management

A-Level Business • Topic 4

A-Level Business



Operations Management

What we will cover

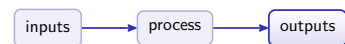
- 1 The transformation process
- 2 Methods of production
- 3 Inventory control
- 4 JIT & capacity
- 5 Outsourcing
- 6 Recap



1 Process and production

Operations Management
└ Process and production

The transformation process



Value is added when the output is worth more than the inputs. Operations management is the job of making that process efficient.

Operations Management
└ Process and production

Methods of production

job

one-off, unique – a wedding cake, a ship

batch

groups of the same item – a bakery's loaves

flow

continuous line – cars, phones

Operations Management
└ Process and production

Sustainability and technology

Sustainability 可持续性: meet today's needs without harming the future – cut waste, use less energy, recycle.
Automation 自动化 raises output & quality and lowers cost, but has a high set-up cost and can replace jobs.



2 Inventory and capacity

Inventory control

Hold too much stock and you tie up cash and pay for storage. Hold too little and you lose sales.

A **buffer stock** 缓冲库存 and a **reorder level** 再订货水平 keep the two in balance.

Reading an inventory-control chart

Maximum inventory The **maximum inventory** 最高库存 level: the most the firm will hold, set by storage space and by cash.

Re-order level The level that triggers a new order, set so the delivery arrives before the buffer is used.

Holding costs **Holding costs** 持有成本: storage, insurance, obsolescence, and the cash tied up in **raw materials** 原材料 sitting on a shelf.

Buffer inventory The minimum kept back against late deliveries or a demand spike – insurance, paid for in holding costs.

Every inventory decision trades a holding cost against a stock-out. Just-in-time chooses one side of that trade deliberately.

Just-in-time vs just-in-case

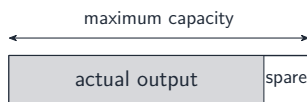
just-in-time

arrive as needed – low holding cost, high supplier risk

just-in-case

keep a buffer – safer against shocks, more cash tied up

Capacity utilisation



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

Aim high but not full (~85–90%): low leaves idle resources; 100% leaves no time to repair.

Working below capacity

Under-utilisation **Under-utilisation** 产能利用不足 means fixed costs are spread over fewer units, so the cost per unit rises.

Why it happens Falling demand, seasonality, a bottleneck elsewhere, or capacity built for growth that has not arrived.

What to do Cut capacity (redundancy, closure), or fill it – subcontract for another firm, add a product, market harder.

The other end Running at 100% leaves no room for maintenance, no slack for a rush order, and tired staff.

Operations **add value** 增值 by turning inputs into something worth more – and idle capacity adds none while still costing.

Outsourcing

Outsourcing 外包 pays another firm to do work you used to do (cleaning, IT, parts).

+ cheaper, focus, flexible

– less control, delays, secrets

Capital- and labour-intensive operations



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

The production methods, and how full to run

labour-intensive 劳动密集型 mostly people – a hair salon. Flexible and good for personal service, but quality varies and wages dominate cost

capital-intensive 资本密集型 mostly machines – consistent and cheap per unit at volume, but a large fixed cost and little flexibility

job 单件生产 production one unique item at a time

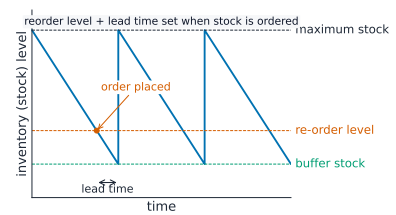
batch 批量生产 production groups of identical items, with a changeover between batches

flow 流水线生产 production a continuous line – lowest unit cost, highest set-up cost

mass customisation 大规模定制 a flow line that still lets customers choose options – cars with chosen colours and trim

Capacity utilisation 产能利用率: most firms aim for 85–90%. **Over-utilisation 产能过度利用** leaves no time for repairs, tires staff and can lower quality.

Inventory control charts



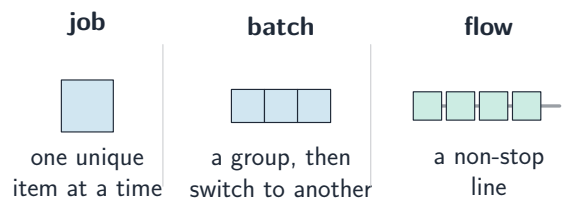
Stock is used up, then replenished when a new order arrives after the lead time

Just-in-time and just-in-case



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)

Methods of production, continued



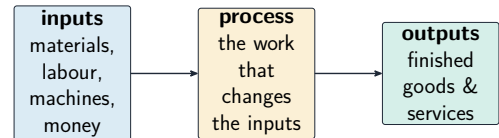
The three methods of production

Productivity and efficiency



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

What operations management does



the output is worth more than the inputs $\Rightarrow$ value added

Operations turn inputs into outputs, adding value along the way

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.

3

Recap

Worked example – labour productivity

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

- Labour productivity = $\frac{\text{total output}}{\text{number of workers}}$
- = $\frac{800}{20} = 40$ units per worker per day
- Higher productivity **cuts the labour cost per unit**, so it improves competitiveness.
- Raise it by training, better capital, or motivation – **not** by simply hiring more.

Productivity is output **per worker**, not total output. Hiring more raises output but leaves productivity unchanged – that distinction earns marks.

Topic 4 – key takeaways

1 Operations

inputs $\rightarrow$ process $\rightarrow$ outputs;
productivity

2 Production

job, batch, flow, mass
customisation

3 Inventory

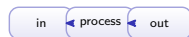
re-order level, buffer; JIT vs JIC

4 Capacity

utilisation; aim high not full

Check yourself

- 1 Which production method suits a one-off item?
- 2 What is buffer inventory for?
- 3 Main risk of just-in-time?
- 4 Capacity utilisation if output is 80 of 100?



Answers 1. job production stops production 2. safety stock for delays/extra demand 3. a late delivery 4. 80%