



# DP IB Business Management: SL



Your notes

## 5.2 Operations Methods

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- \* Types of Production Methods



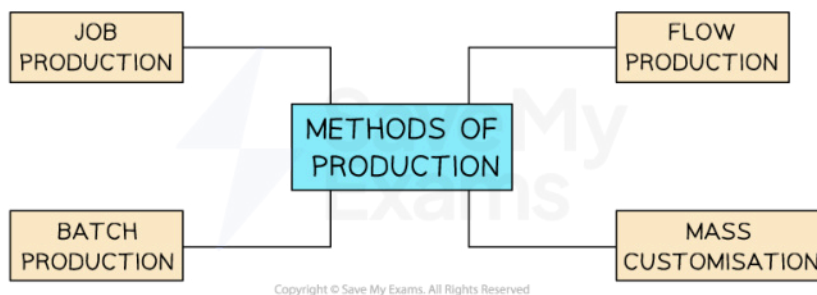
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## Types of Production Methods

# An Introduction to Production Methods

- Production is the **transformation of resources** (e.g. raw materials components and processes) into finished goods or services
  - Goods are **physical products**, such as bicycles and T-shirts
  - Services are **non-physical items** such as hairdressing, tourism and manicures
- Businesses can **organise their production** processes in a variety of ways

## Diagram: methods of production



*The main methods of production*

- The method of production used by a business will depend upon a number of factors
  - The **level of output** required to be produced
  - The **nature** of the product
  - Whether the product is **standardised or customised**
  - The level of **automation** used in production

## Job Production

- Job production is where products are made to meet the **specific requirements of individual customers**
  - Each item is **produced separately (a job)** and the production process is **tailored** to the unique specifications of the customer's order
- The key characteristics of job production include



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- **Customisation**
  - Each product is customised according to the customer's specific requirements
  - This allows for personalised goods or services to be created
- **Low volume**
  - Job production is typically used for unique or specialised products that are not produced in large quantities
- **Variability**
  - Since each product is made to order, there can be significant variation in the production process and materials used
- **Skilled labour**
  - Job production often requires skilled labour such as craftsmen or technicians
  - The manufacturing process may involve intricate tasks or specialised techniques
- **Longer lead time**
  - Due to the customisation and individual production approach job production usually has longer lead times compared to other production methods
  - The time required to fulfil each order can vary depending on its complexity and the availability of resources

#### Evaluation of Job Production

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>▪ Allows for high levels of <b>customisation</b> <ul style="list-style-type: none"> <li>▪ This enables businesses to cater to the unique needs</li> </ul> </li> <li>▪ It provides the <b>flexibility to adapt</b> to changes in customer demands and market trends</li> <li>▪ With a focus on individualised production, job production allows for greater <b>attention to detail</b> and quality control                             <ul style="list-style-type: none"> <li>▪ This often generates the ability to set a premium price</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Tends to be more <b>expensive</b> than other production methods due to the customisation involved</li> <li>▪ The customised nature of job production often leads to <b>long lead times</b> which may not be suitable for customers requiring products to be delivered quickly</li> <li>▪ Job production can be <b>complex and challenging to manage</b> compared to other production methods                             <ul style="list-style-type: none"> <li>▪ It requires close coordination and communication between the production team and the customer to ensure that the</li> </ul> </li> </ul>






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- Job production offers a more **personalised customer experience** as customers have the opportunity to be actively involved in the design and creation process
  - This is likely to lead to customer loyalty

final product meets the desired specifications

- Low-volume production is unlikely to allow a business to achieve **economies of scale**

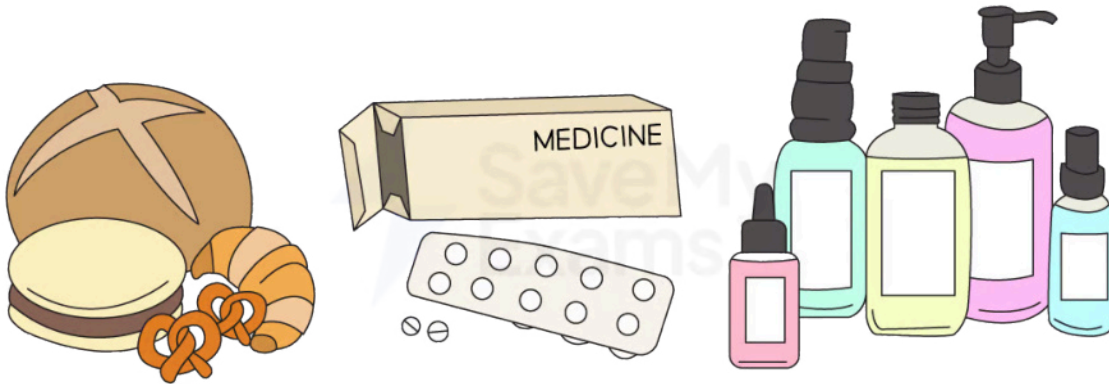
### Examples of Job Production

Furniture made to order, where customers can choose the design, dimensions, materials and finishes	Tailored clothing, such as suits or wedding dresses, where each garment is made to meet the preferences of the individual customer	High-end jewellery pieces, especially those with unique designs or personalised engravings
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## Batch Production

- Batch production occurs when products are **produced in groups** or batches
  - A certain quantity of products is produced together before moving on to the next batch
  - Each batch goes through the **entire production process**, from raw materials to the finished product, before the next batch begins
  - Batches are usually of a **standardised size and composition** and follow a certain sequence of operations

### Diagram: examples of batch-produced goods



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**Batch production is a common approach used in industries including pharmaceuticals, beauty products and food processing**

- Batch production strikes a **balance between customisation and cost-effectiveness**, making it a suitable production method for industries that deal with **diverse product ranges** and **varying customer needs**

#### Evaluation of Batch Production

Advantages	Disadvantages
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- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>▪ Batch production allows manufacturers to <b>switch between batches</b> and <b>cater for varying customer demands</b></li><li>▪ It can be more <b>cost-effective</b> compared to flow production especially when producing items in smaller quantities</li><li>▪ It allows a business to benefit to some extent from <b>purchasing economies of scale</b> as larger quantities of stock may be purchased than with job production</li><li>▪ <b>Quality</b> issues can be identified and defects can be rectified within a specific batch before moving on to the next, minimising the impact on the entire production line</li><li>▪ Batch production is suitable for customised or specialised products because manufacturers can <b>tailor each batch to meet specific customer requirements</b></li></ul> | <ul style="list-style-type: none"><li>▪ Setting up the equipment and configuring the production line for each batch can be <b>time-consuming</b> and may result in idle time between batches</li><li>▪ Often leads to the <b>accumulation of stock</b> which requires storage and careful management to avoid wastage</li><li>▪ While batch production offers flexibility it is <b>not as adaptable as other production methods</b> such as flow production<ul style="list-style-type: none"><li>▪ Rapid changes in product demand or frequent product variations may be difficult to manage</li></ul></li><li>▪ Frequent start-up and shutdown of machinery can put additional <b>stress on equipment</b>, requiring regular maintenance and repair to ensure smooth operations</li></ul> |
|---|--|

## Mass/Flow Production

- Flow production occurs when a product is produced in a **continuous sequence of operations on a production line**
- It involves the movement of materials or components through a series of workstations or machines with each workstation performing a specific task or operation
  - As a product moves along the **production line** it undergoes a series of operations, such as assembly, testing, packaging or quality control until it is completed
- This method is commonly used in industries that produce **high volumes of standardised products** such as automobiles and consumer electronics
- The key characteristics of flow production include:
  - **Division of labour**
    - Different tasks are allocated to different workstations or machines, allowing workers to specialise in a specific task
  - **Standardisation**



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- The manufacture of identical products helps to ensure consistency and a smooth flow of production
- **Continuous movement**
  - The product moves continuously from one workstation to another, minimising idle time and maximising productivity
- **High volume**
  - Flow production is suitable for high-volume manufacturing as it enables the efficient production of large quantities of identical or similar products
- **Automation**
  - Flow production often involves the use of machinery and automated equipment to perform repetitive tasks quickly and accurately

**Evaluation of Flow Production**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>▪ Flow production <b>minimises setup time and reduces idle time</b>, leading to improved overall efficiency</li> <li>▪ The continuous flow of production <b>eliminates the need for frequent equipment start-ups and shutdowns</b>, reducing energy consumption and minimising material waste</li> <li>▪ <b>Labour costs may be lower</b> due to automation and processes that require less skilled workers</li> <li>▪ Allows for greater <b>control over product quality</b> because it is easy to identify and address any deviations or defects early on</li> <li>▪ Enables <b>fast production</b>, resulting in <b>short lead times</b>, which help companies respond more quickly to market demands</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implementing flow production systems often requires <b>significant capital investment</b> to purchase expensive manufacturing equipment and automation technologies</li> <li>▪ It relies on the <b>reliability and efficiency of equipment and machinery</b> <ul style="list-style-type: none"> <li>▪ If any part of the production line breaks down, it can disrupt the entire process, leading to costly downtime</li> </ul> </li> <li>▪ It is best <b>suited for standardised products</b>, which can pose challenges in industries that require frequent product customisation</li> <li>▪ If a defect is detected, it may require the <b>stoppage of the entire production line</b>, resulting in substantial losses</li> <li>▪ Relies on a <b>steady supply of raw materials</b> and components           <ul style="list-style-type: none"> <li>▪ Any disruption in the supply chain can have a severe impact on production</li> </ul> </li> </ul>





## Examiner Tips and Tricks

Carefully consider the needs of the customers to which a business sells when recommending a suitable method of production. Where the selling price is a key driver of consumer demand, flow production (where **unit costs** are minimised) is likely to be very suitable. Where demand is driven by quality, or where customisation is required, job or batch production are likely to be better choices.



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## Mass Customisation

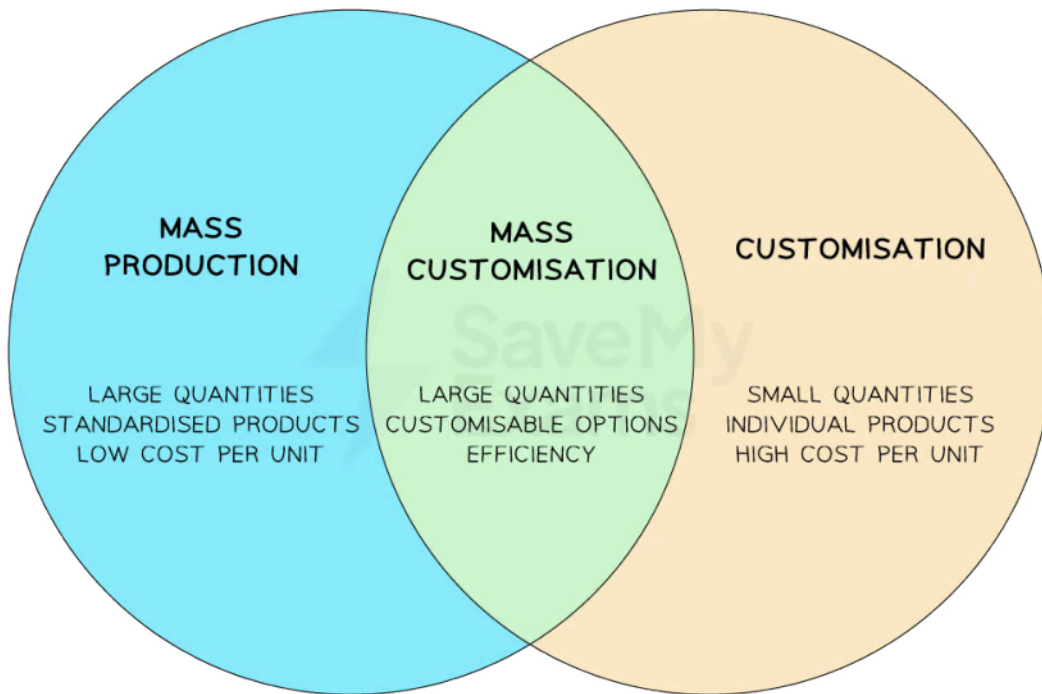
- **Mass production** is usually achieved through flow production and involves the manufacture of **large quantities of standardised products**
  - This results in low costs per unit compared to other methods of production
- **Customisation** is usually associated with job production or small-scale batch production
  - It allows customers to **design products from scratch**
- **Mass customisation** seeks to bridge this gap
  - It offers **flexibility** with a range of customisable options within a standardised production process
  - It benefits from the **low unit costs** typically associated with flow production
    - It uses **technology**, such as computer-aided design (CAD), flexible manufacturing systems and data analytics to efficiently accommodate customer preferences

## Diagram: mass customisation





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**A comparison of mass production, customisation and mass customisation**

- The process of mass customisation typically involves **three key elements**

**Elements of Mass Customisation at Audi**

Stage	Explanation	Example
<b>1. Choice</b>	<ul style="list-style-type: none"> <li>▪ Customers are presented with a <b>range of pre-designed product options</b>, features or configurations from which they can choose</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Audi</b> customers can select a specific model, such as the Avant, Saloon, Coupé or Sportback and decide the trim level from Premium, Premium Plus and Prestige</li> </ul>
<b>2. Customisation</b>	<ul style="list-style-type: none"> <li>▪ Customers have the opportunity to <b>personalise their chosen product</b> by selecting specific features, colours, sizes or other configurable elements</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Audi</b> customers can choose extra features such as driver assistance tools, a towbar or a dashcam</li> </ul>



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<b>3. Production</b>	<ul style="list-style-type: none"><li>Once the customer's preferences are received, the <b>manufacturing</b> process can begin</li><li>The production system is designed to efficiently produce the customised product, often using flexible manufacturing techniques such as <b>cell production</b></li></ul>	<ul style="list-style-type: none"><li>At <b>Audi</b> each new vehicle takes between six and twelve weeks to manufacture on the highly automated production plant in Germany, with steps involving the use of 3D printing and artificial intelligence</li></ul>
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- Mass customisation offers several **advantages for both businesses and customers**
  - Customers can obtain **products that match their unique preferences** and requirements and are likely to be **highly satisfied** which leads to **positive feedback and loyalty**
  - Businesses can **adapt to changing market demands** effectively by offering a wide range of product variations **without the expense of full customisation**
  - By utilising standardised components and processes mass customisation **allows businesses to achieve economies of scale**, reduce stock costs and improve overall production efficiency
  - Mass customisation can **differentiate a company from competitors**, attract new customers and create a perception of high value and innovation
- However, mass customisation usually **requires heavy capital investment** in technology and **variable costs tend to be higher** than for standardised, mass produced items