LEARNING GOALS

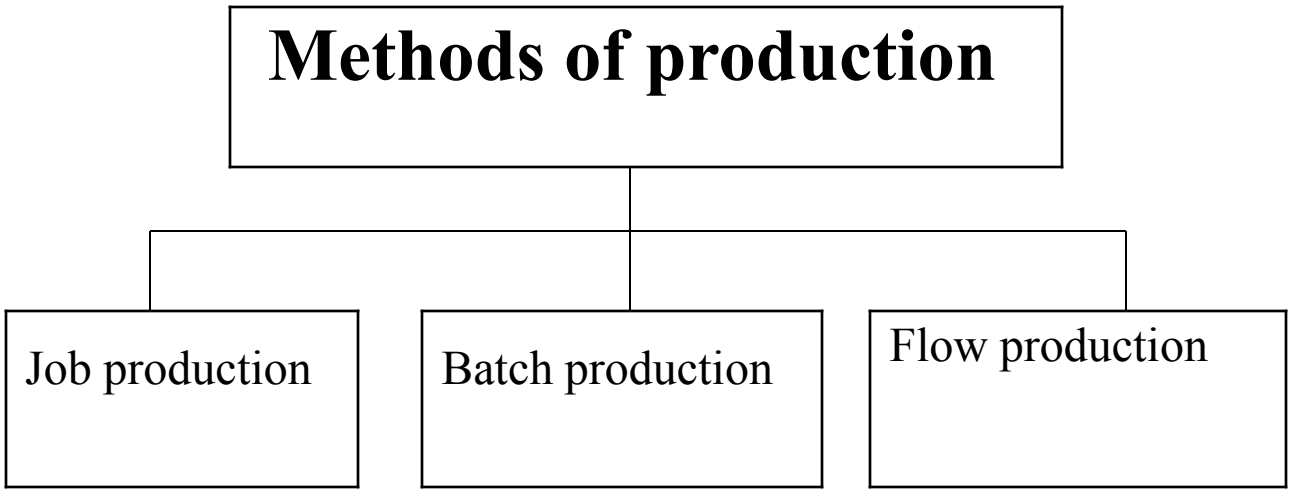
- State the definition of production
- Explain job production and its advantages and disadvantages
- Explain batch production and its advantages and disadvantages
- Explain flow production and its advantages and disadvantages
- State the factors that may affect the firm's choice of production methods

Definition of production

- Production takes place when resources such as raw materials or components, are changed into ‘products’.
- It refers to those activities that bring a product into being.

Three methods of production

Figure:



Three methods of production

Job production

- It involves the production of a single product at a time.

Job production

Advantages:

- Able to produce unique orders to meet customers' individual needs.
- More likely to motivate workers (see end results)
- Fairly simple way of production(one a time)

Disadvantages:

- Labor intensiveness and high costs
- High selling costs
- Not fit for mass production and large demand

Three methods of production

Job production

Batch production

- This involves dividing the work into a number of different operations, or a method that involves completing one operation at a time on all units before performing the next.

Batch production

Advantages:

- Suitable for a wide range of similar products
- Reducing the need for skilled workers
- More standardized products and less machinery needed

Disadvantages:

- Higher unit costs for small batch
- Less motivated workers for repetitive one operation
- Careful planning needed to reduce idle machines or worker waiting

Three methods of production

Job production

Batch production

Flow production

- It is a method of large-scale production of standardized products, where each operation on a unit is performed continuously one after another, usually on a production assemble line
- It often includes mass, repetitive and process production.

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Flow production

Advantages:

- Large scale production and reduced unit costs
- Highly automated and high efficiency
- Able to produce large quantity of products

Disadvantages:

- Very high investment cost in machinery and equipment
- Limited ability to meet unique customer needs
- Repetitive operation and less motivation
- High costs with the breakdown of machines

Factors affecting the choice of proper production methods

- The nature of the product

  Different products may require a specific production method.

- The size of market

  A big or small market may require a different production method.

- The stage of business' development

  A start-up firm or large established firm will use different production methods.

- The current state of technology

  Changes in technology result in firms using new mass production methods.

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Strategic Importance of the Production Function

- **Mass Production—**system for manufacturing products in large amounts through effective combinations of employees with specialized skills, mechanization, and standardization
  - **Assembly Line—**manufacturing technique that carries the product on a conveyor system past several workstations where workers perform specialized tasks.

Strategic Importance of the Production Function

- **Flexible production**—cost-effective system of producing small batches of similar items
- **Customer-driven production**—system that evaluates customer demands in order to link what a manufacture makes with what the customers want to buy
- **Team concept production**—combines employees from various departments and functions to work together in designing and building products

Production Processes

- Methods of production differ according to firms' means of operating and time requirements
- Means of operating may involve either an **analytic** or a **synthetic system**
- Time requirements call for either a **continuous** or an **intermittent process**

Technology and the Production Process

- **Robots—**reprogrammable machine capable of performing numerous tasks that require manipulations of materials and tools.
  - **Pick-and-place robots取放型*机器人***
  - **Field robots野外作业型*机器人***
  - Service robots
  - **Nanotechnology纳米技术**

Technology and the Production Process

- **Computer-Aided Design and Computer Aided Manufacturing**
  - **Computer-aided design** (CAD)—system for interactions between a designer and a computer to design a product, facility or part the meets predetermined specifications.

Technology and the Production Process

- Computer-Aided Design and Computer Aided Manufacturing
  - **Computer-aided manufacturing** (CAM)—electronic tools to analyze CAD output and determine necessary steps to implement the design, followed by electronic transmission of instructions to guide the activities of production equipment.

The Job of Production Managers

- **Inventory Control**
  - Requires balancing the need to keep stocks on hand to meet demand against the expenses of carrying the inventory
  - Perpetual inventory: system that continuously monitors the amounts and location of inventory
  - Vendor-managed inventory: system that hands over a firm's inventory control functions to suppliers

The Job of Production Managers

- **Implementing the Production Plan**
  - **Just-in-Time System—**management philosophy aimed at improving profits and return on investment by minimizing costs and eliminating waste through cutting inventory on hand.

The Job of Production Managers

- **Implementing the Production Plan**
  - **Material Requirement Planning** (MRP)—computer-based production planning system by which a firm can ensure that it has needed parts and materials available at the right time and place in the correct amounts.

The Job of Production Managers

- **Controlling the Production Process**
  - **Production planning—**determines the amount of resources (including raw materials and other components) a firm needs to produce a certain output
  - **Routing—**determines the sequence of work throughout the facility and specifies who will perform each aspect of production at what location

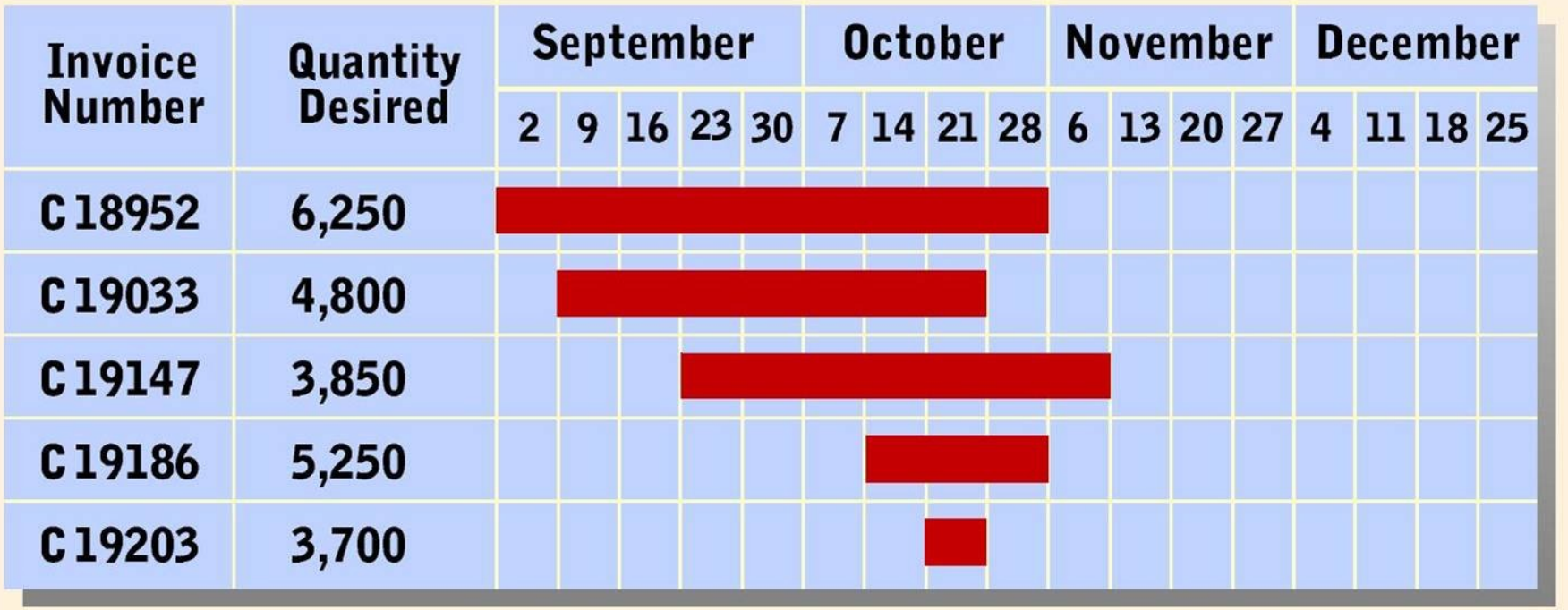
The Job of Production Managers

- **Controlling the Production Process**
  - **Scheduling—**development of timetables that specify how long each operation in the production process takes and when workers should perform it.

The Job of Production Managers

- **Controlling the Production Process**
  - **Gantt chart**—tracks projected and actual work progress over time
  - **PERT** (Program Evaluation and Review Technique)—chart which seeks to minimize delays by coordinating all aspects of the production process
    - **Critical Path**—sequence of operations that requires the longest time for completion

- Sample Gantt Chart



- PERT Diagram for Building a Home