Course Name: Introduction to CAD CAM

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Types of Manufacturing Systems

1. **Job-shop production**. Production of low quantities, often one of a kind, of specialized products. The products are often customized and technologically complex. Examples: prototypes, aircraft, machine tools and other equipment.
2. **Batch production.** Production of medium lot sizes of the same product. The lot may be produced once or repeated periodically. Examples: books, clothing and certain industrial machinery.
3. **Mass production of discrete products**. Dedicated production of large quantities of one product (with perhaps limited model variations). Examples include automobiles, electronic appliances and engine blocks.
4. **Continuous-flow processes**. Continuous dedicated production of large amount of bulk product. Continuous manufacturing is represented by chemicals, plastics, petroleum, and food industries.

Product quantity Vs Product Variety

Production Quantity

- Refers to the number of units of a given part or product produced annually by a plant

Production Variety

- Refers to the different product types or designs that are produced in a plant
- Products with different shapes, sizes and styles etc.

High Production Variety

- When the number of product types made in a Factory is High

Low Production Variety

- When the number of product types made in a Factory is Low

Hard Product Variety

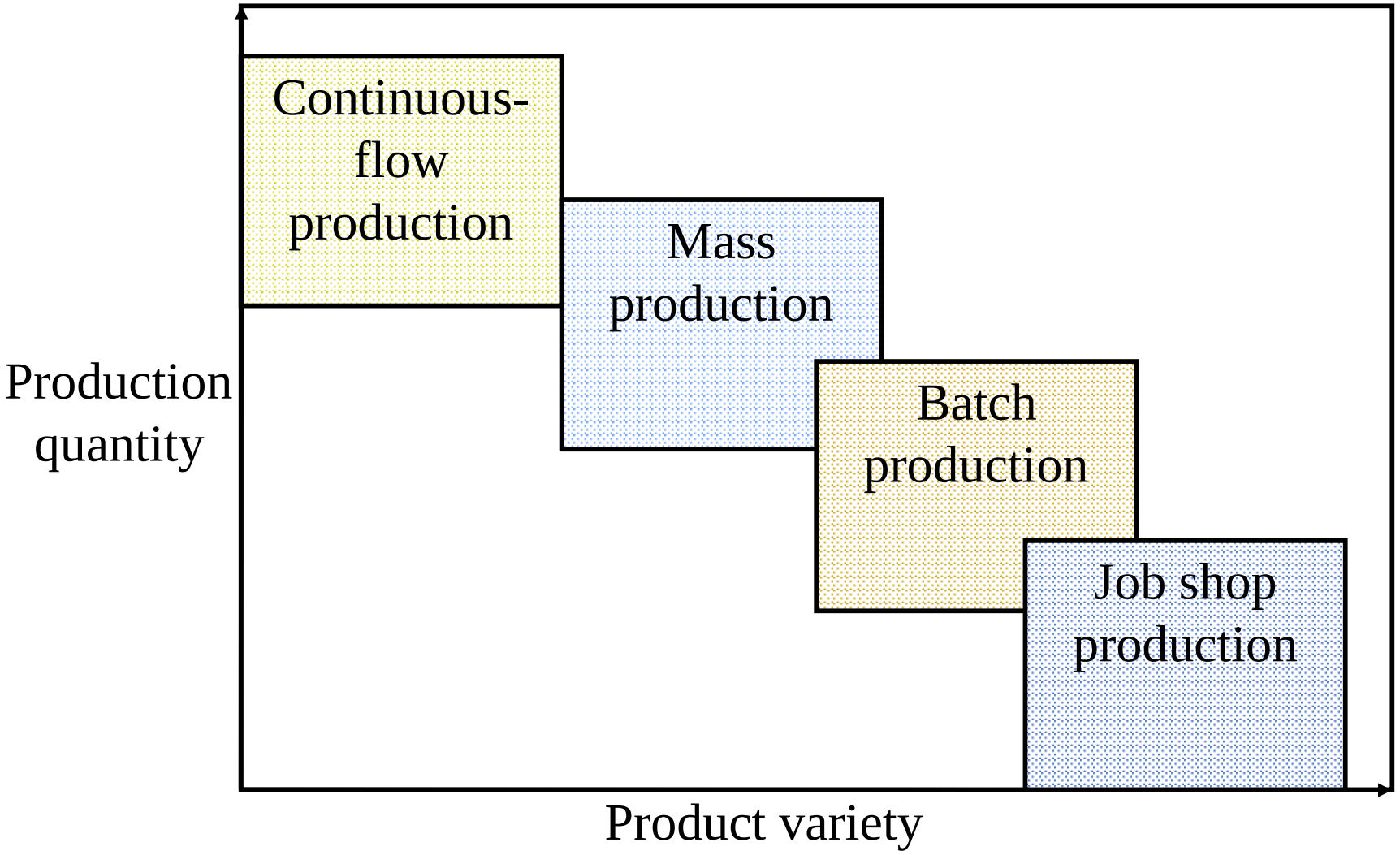
- If the products differs substantially
- If the proportion of common parts are very low OR there may be no common parts
- Difference between a CAR and TRUCK (HARD)

Soft Product Variety

- Small differences between the Products
- Proportion of common parts is high
- Example (Differences between CAR MODELS)

Relation Between Product Variety And Production Quantity

- Inverse relation exist between the two
- When product variety is high, production quantity tends to be low


Continuous-flow production
Mass production
Batch production
Job shop production
Production quantity
Product variety

Computer-Aided Manufacturing (CAM)

- Use of computer systems to plan, manage, and control manufacturing operations
- Direct or indirect computer interface with the plant's production resources

For Example

- 3D Printer
- Numerical control of machine tools (CNC Lathe, CNC Mill, CNC Drilling Machines, etc.)
- Robots

Purpose of Computer-aided manufacturing (CAM)

- Its primary purpose is to create a faster production process and with more precise dimensions and material consistency, which in some cases, uses only the required amount of raw material (thus minimizing waste), while simultaneously reducing energy consumption.

Advantages of CAD/CAM systems

- Greater flexibility.
- Reduced lead times.
- Reduced inventories.
- Increased Productivity.
- Improved customer service.
- Improved quality.
- Improved communications with suppliers.
- Better product design.
- Greater manufacturing control.
- Reduced costs.