Fold each printed sheet in half lengthwise. The left side of the document will list the term and the right side will list the definition. Tape or staple the open edges of your flashcards. Cut out your flashcards on the solid lines indicated and fold them on the dotted lines.

Module 1
Section E: Environments, Types, and Layouts

Term
Assemble-to-order (ATO)

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A production environment where a good or service can be assembled after receipt of a customer's order. The key components (bulk, semi-finished, intermediate, subassembly, fabricated, purchased, packing, and so on) used in the assembly or finishing process are planned and usually stocked in anticipation of a customer order. Receipt of an order initiates assembly of the customized product. This strategy is useful where a large number of end products (based on the selection of options and accessories) can be assembled from common components. Syn.: finish-to-order. See: make-to-order, make-to-stock.

Module 1
Section E: Environments, Types, and Layouts

Term
Assembly line

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An assembly process in which equipment and work centers are laid out to follow the sequence in which raw materials and parts are assembled. See: line, production line.

Module 1
Section E: Environments, Types, and Layouts

Term
Cell

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A manufacturing or service unit consisting of a number of workstations and the materials transport mechanisms and storage buffers that interconnect them.

Module 1
Section E: Environments, Types, and Layouts

Term
Cellular layout

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An equipment configuration to support cellular manufacturing.

Module 1
Section E: Environments, Types, and Layouts

Term
Cellular manufacturing

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A manufacturing process that produces families of parts within a single line or cell of machines controlled by operators who work only within the line or cell.

Module 1
Section E: Environments, Types, and Layouts

Term
Component

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The raw material, part, or subassembly that goes into a higher-level assembly, compound, or other item. This term may also include packaging materials for finished items. See: ingredient, intermediate part.

Module 1
Section E: Environments, Types, and Layouts

Term
Continuous production

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A production system in which the productive equipment is organized and sequenced according to the steps involved to produce the product. This term denotes that material flow is continuous during the production process. The routing of the jobs is fixed and setups are seldom changed. Syn.: continuous flow (production), continuous process, continuous manufacturing. See: mass production, project manufacturing.

Module 1
Section E: Environments, Types, and Layouts

Term
Customer tolerance time

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The amount of time potential customers are willing to wait for the delivery of a good or a service. Syn.: demand lead time.

Module 1
Section E: Environments, Types, and Layouts

Term
Decoupling points

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The locations in the product structure or distribution network where inventory is placed to create independence between processes or entities. Selection of decoupling points is a strategic decision that determines customer lead times and inventory investment. See: control points.

Module 1
Section E: Environments, Types, and Layouts

Term
Delivery lead time

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The time from the receipt of a customer order to the delivery of the product. Syn.: delivery cycle.

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Section E: Environments, Types, and Layouts

Term
Demand-driven material requirements planning (DDMRP)

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A method for planning material needs that enables a company to build more closely to actual market requirements.

Module 1
Section E: Environments, Types, and Layouts

Term
Demand-driven supply network

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A situation in which a customer purchase initiates real-time information flows through the supply chain that consequently cause movement of product through the network.

Module 1
Section E: Environments, Types, and Layouts

Term
Discrete manufacturing

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The production of distinct items such as automobiles, appliances, or computers.

Module 1
Section E: Environments, Types, and Layouts

Term
Engineer-to-order (ETO)

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Products whose customer specifications require unique engineering design, significant customization, or new purchased materials. Each customer order results in a unique set of part numbers, bills of material, and routings. Syn.: design-to-order.

Module 1
Section E: Environments, Types, and Layouts

Term
Facility layout

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Describes where machines and utilities will be located in a facility, as well as the arrangement of processes.

Module 1
Section E: Environments, Types, and Layouts

Term
Fixed-position layout

APICS CPIM Learning System © 2025

A factory layout that plans for the product to be in a set place; the people, machines, and tools are brought to and from the product.

Module 1
Section E: Environments, Types, and Layouts

Term
Flow processing

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In process systems development, work flows from one workstation to another at a nearly constant rate and with no delays. When producing discrete (geometric) units, the process is called repetitive manufacturing; when producing non-geometric units over time, the process is called continuous manufacturing. A physical-chemical reaction takes place [when this process is continuous.]

Module 1
Section E: Environments, Types, and Layouts

Term
Flow shop

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A form of manufacturing organization in which machines and operators handle a standard, usually uninterrupted, material flow. The operators generally perform the same operations for each production run. [This] is often referred to as a mass production shop or is said to have a continuous manufacturing layout. The plant layout (arrangement of machines, benches, assembly lines, etc.) is designed to facilitate a product "flow." Some process industries (chemicals, oil, paint, etc.) are extreme examples of [this]. Each product, though variable in material specifications, uses the same flow pattern through the shop. Production is set at a given rate, and the products are generally manufactured in bulk. Syn.: flow line, flow manufacturing, flow plant.

Module 1
Section E: Environments, Types, and Layouts

Term
Focused factory

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A plant established to focus the entire manufacturing system on a limited, concise, manageable set of products, technologies, volumes, and markets precisely defined by the company's competitive strategy, technology, and economics. See: cellular manufacturing.

Module 1
Section E: Environments, Types, and Layouts

Term
Functional layout

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A facility configuration in which operations of a similar nature or function are grouped together; an organizational structure based on departmental specialty (e.g., saw, lathe, mill, heat treat, press). Syn.: job shop layout, process layout.

Module 1
Section E: Environments, Types, and Layouts

Term
Gantt chart

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The earliest and best-known type of planning and control chart. It is especially designed to show graphically the relationship between planned performance and actual performance over time. Used for (1) machine loading, in which one horizontal line is used to represent capacity and another to represent load against that capacity, or (2) monitoring job progress, in which one horizontal line represents the production schedule and another parallel line represents the actual progress of the job against the schedule in time.

Module 1
Section E: Environments, Types, and Layouts

Term
Group technology (GT)

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An engineering and manufacturing philosophy that identifies the physical similarity of parts (common routing) and establishes their effective production. It provides for rapid retrieval of existing designs and facilitates a cellular layout.

Module 1
Section E: Environments, Types, and Layouts

Term
Intermittent production

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A form of manufacturing in which the jobs pass through the functional departments in lots, and each lot may have a different routing. See: job shop.

Module 1
Section E: Environments, Types, and Layouts

Term
Make-to-order (MTO)

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A production environment where a good or service can be made after receipt of a customer's order. The final product is usually a combination of standard items and items custom-designed to meet the special needs of the customer. Where options or accessories are stocked before customer orders arrive, the term assemble-to-order is frequently used. Syn.: build-to-order. See: assemble-to-order, make-to-stock.

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Section E: Environments, Types, and Layouts

Term
Make-to-stock (MTS)

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A production environment where products can be and usually are finished before receipt of a customer order. Customer orders are typically filled from existing stocks, and production orders are used to replenish those stocks. Syn.: produce-to-stock. See: assemble-to-order, make-to-order.

Module 1
Section E: Environments, Types, and Layouts

Term
Manufacturing environment

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The framework in which manufacturing strategy is developed and implemented. [Elements... include] external environmental forces; corporate strategy; business unit strategy; other functional strategies (marketing, engineering, finance, etc.); product selection; product/process design; product/process technology; and management competencies. Often refers to whether a company, plant, product, or service is make-to-stock, make-to-order, or assemble-to-order. Syn.: production environment.

Module 1
Section E: Environments, Types, and Layouts

Term
Manufacturing lead time

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The total time required to manufacture an item, exclusive of lower-level purchasing lead time. For make-to-order products, it is the length of time between the release of an order to the production process and shipment to the final customer. For make-to-stock products, it is the length of time between the release of an order to the production process and receipt into inventory. Included are order preparation time, queue time, setup time, run time, move time, inspection time, and put-away time. Syn.: manufacturing cycle, production cycle, production lead time. See: lead time.

Module 1
Section E: Environments, Types, and Layouts

Term
Manufacturing philosophy

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The set of guiding principles, driving forces, and ingrained attitudes that helps communicate goals, plans, and policies to all employees and that is reinforced through conscious and subconscious behavior within the manufacturing organization.

Module 1
Section E: Environments, Types, and Layouts

Term
Manufacturing process

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The series of operations performed upon material to convert it from the raw material or a semifinished state to a state of further completion. [It] can be arranged in a process layout, product layout, cellular layout, or fixed-position layout. [It also] can be planned to support make-to-stock, make-to-order, assemble-to-order, and so forth, based on the strategic use and placement of inventories. See: production process, transformation process.

Module 1
Section E: Environments, Types, and Layouts

Term
Manufacturing strategy

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A collective pattern of decisions that acts upon the formulation and deployment of manufacturing resources. To be most effective, [it] should act in support of the overall strategic direction of the business and provide for competitive advantages (edges).

Module 1
Section E: Environments, Types, and Layouts

Term
Mass customization

APICS CPIM Learning System © 2025

The use of mass production techniques to create large volume of products in a wide variety keeping production costs low while enabling customized output primarily utilizing postponement or delayed differentiation.

Module 1
Section E: Environments, Types, and Layouts

Term
Modular design strategy

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The strategy of planning and designing products so that components or subassemblies can be used in current and future products or assembled to produce multiple configurations of a product. [...].

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Section E: Environments, Types, and Layouts

Term
Modularization

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In product development, the use of standardized parts for flexibility and variety. Permits product development cost reductions by using the same item(s) to build a variety of finished goods. This is the first step in developing a planning bill of material process.

Module 1
Section E: Environments, Types, and Layouts

Term
Nesting

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The act of combining several small processes to form one larger process.

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Section E: Environments, Types, and Layouts

Term
Option

APICS CPIM Learning System © 2025

A choice that must be made by the customer or company when customizing the end product. In many companies, [it] means a mandatory choice from a limited selection. See: feature.

Module 1
Section E: Environments, Types, and Layouts

Term
Package to order

APICS CPIM Learning System © 2025

A production environment in which a good or service can be packaged after receipt of a customer order. The item is common across many different customers; packaging determines the end product.

Module 1
Section E: Environments, Types, and Layouts

Term
Postponement

APICS CPIM Learning System © 2025

A product design or supply chain strategy that deliberately delays final differentiation of a product (assembly, production, packaging, tagging, etc.) until the latest possible time in the process. This shifts product differentiation closer to the consumer to reduce the anticipatory risk of producing the wrong product. The practice eliminates excess finished goods in the supply chain. This strategy is sometimes referred to as delayed differentiation.

Module 1
Section E: Environments, Types, and Layouts

Term
Process flexibility

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The design of the manufacturing system, including operators and machinery, that allows quick changeovers to respond to near-term changes in product volume and mix. A necessary tool in lean and just in time.

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Section E: Environments, Types, and Layouts

Term
Procurement lead time

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The time required to design a product, modify or design equipment, conduct market research, and obtain all necessary materials. Lead time begins when a decision has been made to accept an order to produce a new product and ends when production commences. Syn.: procurement cycle, total procurement lead time. See: time-to-market.

Module 1
Section E: Environments, Types, and Layouts

Term
Product layout

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Another name for flow process layout. A system that is set up for a limited range of similar products. Focused-factory production is also considered to be in this category. See: flow processing, focused factory.

Module 1
Section E: Environments, Types, and Layouts

Term
Product-based layout

APICS CPIM Learning System © 2025

A type of layout where resources are arranged sequentially according to the steps required to make a particular complex product.

Module 1
Section E: Environments, Types, and Layouts

Term
Production line

APICS CPIM Learning System © 2025

A series of pieces of equipment dedicated to the manufacture of a specific number of products or families.

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Section E: Environments, Types, and Layouts

Term
Project management

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The use of skills and knowledge in coordinating the organizing, planning, scheduling, directing, controlling, monitoring, and evaluating of prescribed activities to ensure that the stated objectives of a project, manufactured good, or service are achieved. See: project.

Module 1
Section E: Environments, Types, and Layouts

Term
Pull system

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1) In production, the production of items only as demanded for use or to replace those taken for use. See: pull signal. 2) In material control, the withdrawal of inventory as demanded by the using operations. Material is not issued until a signal comes from the user. 3) In distribution, a system for replenishing field warehouse inventories where replenishment decisions are made at the field warehouse itself, not at the central warehouse or plant.

Module 1
Section E: Environments, Types, and Layouts

Term
Purchasing lead time

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The total lead time required to obtain a purchased item. Included here are order preparation and release time; supplier lead time; transportation time; and receiving, inspection, and put-away time. See: lead time, supplier lead time, time-to-product.

Module 1
Section E: Environments, Types, and Layouts

Term
Push system

APICS CPIM Learning System © 2025

1) In production, the production of items at times required by a given schedule planned in advance. 2) In material control, the issuing of material according to a given schedule or issuing material to a job order at its start time. 3) In distribution, a system for replenishing field warehouse inventories where replenishment decision making is centralized, usually at the manufacturing site or central supply facility. See: pull system.

Module 1
Section E: Environments, Types, and Layouts

Term
Remanufacturing

APICS CPIM Learning System © 2025

1) An industrial process in which worn-out products are restored to like-new condition. In contrast, a repaired product normally retains its identity, and only those parts that have failed or are badly worn are replaced or serviced. 2) The manufacturing environment where worn-out products are restored to like-new condition.

Module 1
Section E: Environments, Types, and Layouts

Term
Repetitive manufacturing

APICS CPIM Learning System © 2025

The repeated production of the same discrete products or families of products. Repetitive methodology minimizes setups, inventory, and manufacturing lead times by using production lines, assembly lines, or cells. Work orders are no longer necessary; production scheduling and control are based on production rates. Products may be standard or assembled from modules. Repetitiveness is not a function of speed or volume.

Module 1
Section E: Environments, Types, and Layouts

Term
Service

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Sometimes used to describe those activities that support the production or distribution functions in any [organization...].

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Section E: Environments, Types, and Layouts

Term
Supplier lead time

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The amount of time that normally elapses between the time an order is received by a supplier and the time the order is shipped. Syn.: vendor lead time. See: purchasing lead time.

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Section E: Environments, Types, and Layouts

Term
U-lines

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Production lines shaped like the letter “U.” [This] shape allows workers to easily perform several nonsequential tasks without much walk time. The number of workstations in [this type of production line] is usually determined by line balancing. [These also] promote communication.

Module 1
Section E: Environments, Types, and Layouts

Term
Work breakdown structure

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In project management, a hierarchical description of a project in which each lower level is more detailed. See: project summary work breakdown structure.

Module 1

Section E: Environments, Types, and Layouts

Term

Work cell

Dissimilar machines grouped together into a production unit to produce a family of parts having similar routings.