**Operations Management – various terminologies**

**Compiled by Prof B V R Murty.**

**Process** Any set of activities performed by an organization that takes inputs and transforms them into outputs ideally of greater value to the organization than the original inputs.

**Cycle time** The average time between completions of successive units in a process (this is the definition used in this book). The term is sometimes used to mean the elapsed time between starting and completing a job.

**Utilization** The ratio of the time that a resource is actually activated relative to the time that it is available for use.

**Bottleneck** A resource that limits the capacity or maximum output of the process.

**Make-to-order** A process that is activated only in response to an actual order.

**Make-to-stock** A process that produces standard products that are stored in finished goods inventory. The product is delivered quickly to the customer from the finished goods inventory.

**Hybrid** Combines the features of both make-to-order and make-to-stock. Typically, a generic product is made and stocked at some point in the process. These generic units are customized in a final process to meet actual orders.

**Productivity** The ratio of output to input. Taking the dollar value of the output and dividing by the dollar value of the inputs usually measures total factor productivity. Alternatively, partial factor productivity is measured based on an individual input and often is not calculated using dollar values (an example would be units/person).

**Efficiency** A ratio of the actual output of a process relative to some standard.

**Run time** The time required to produce a batch of parts.

**Setup time** The time required to prepare a machine to make a particular item.

**Operation time** The sum of the setup time and run time for a batch of parts that are run on a machine.

**Throughput time** The average time that it takes a unit to move through an entire process. Usually the term lead time is used to refer to the total time that it takes a customer to receive an order (includes time to process the order, throughput time, and delivery time).

**Throughput rate** The output rate that the process is expected to produce over a period of time.

**Value-added time** The time in which useful work is actually being done on the unit.

**Service Processes**

**High and low degree of customer contact** The physical presence of the customer in the system and the percentage of time the customer must be in the system relative to the total time it takes to perform the service.

**Service blueprint** The flowchart of a service process, emphasizing what is visible and what is not visible to the customer.

**Poka-yokes** Procedures that prevent mistakes from becoming defects. They are commonly found in manufacturing but also can be used in service processes.

**Service guarantee** A promise of service satisfaction backed up by a set of actions that must be taken to fulfill the promise.

**Operations Strategy**

**Operations and supply strategy** Setting broad policies and plans for using the resources of a firm to best support the firm's long-term competitive strategy.

**Order winner** A dimension that differentiates the products or services of one firm from those of another.

**Order qualifier** A dimension used to screen a product or service as a candidate for purchase.

**New Product Development**

**Contract manufacturer** An organization capable of manufacturing and/or purchasing all the components needed to produce a finished product or device.

**Core competency** The one thing that a firm can do better than its competitors. The goal is to have a core competency that yields a long-term competitive advantage to the company.

**Concurrent engineering** Emphasizes cross-functional integration and concurrent development of a product and its associated processes.

**Value analysis/Value engineering (VA/VE)** Analysis with the purpose of simplifying products and processes by achieving equivalent or better performance at a lower cost.

**Facility Location**

**Factor-rating system** An approach for selecting a facility location by combining a diverse set of factors. Point scales are developed for each criterion. Each potential site is then evaluated on each criterion, and the points are combined to calculate a rating for the site.

**Transportation method** A special linear programming method that is useful for solving problems involving transporting products from several sources to several destinations.

**Centroid method** A technique for locating single facilities that considers the existing facilities, the distances between them and the volumes of goods to be shipped.

**Facility Layout**

**Workcenter** Also called a job-shop or functional layout; a format in which similar equipment or functions re grouped together.

**Assembly line** Equipment or work processes are arranged according to the progressive steps by which the product is made.

**Group technology - Manufacturing cell** Groups dissimilar machines to work on products that have similar shapes and processing requirements.

**Project layout** The product remains at one location, and equipment is moved to the product.

**Systematic layout planning (SLP)** A technique for solving process layout problems when the use of numerical flow data between departments is not practical. The technique uses an activity relationship diagram that is adjusted by trial and error until a satisfactory adjacency pattern is obtained.

**Workstation cycle time** The time between successive units coming off the end of an assembly line.

**Assembly-line balancing** The problem of assigning all the tasks to a series of workstations so that each workstation has no more than can be done in the workstation cycle time, and so that idle time across all workstations is minimized.

**Precedence relationship** The order in which tasks must be performed in the assembly process..

**Capacity planning**

**Capacity** The amount of output that a system is capable of achieving over a specific period of time.

**Strategic capacity planning** Determining the overall capacity level of capital level of capital-intensive resources that best supports the company's long-range competitive strategy.

**Best operating level** The level of capacity for which the process was designed and the volume of output at which average unit cost is minimized.

**Capacity utilization rate** Measures how close a firm is to its best operating level.

**Capacity cushion** Capacity in excess of expected demand.

**Operations Planning & control**

**Dependent demand** Requirements for a product or service caused by the demand for other products or services. This type of internal demand does not need a forecast, but can be calculated based on the demand for the other products or services.

**Independent demand** Demand that cannot be directly derived from the demand for other products.

**Aggregate operations plan** Translating annual and quarterly business plans into labor and production output plans for the intermediate term. The objective is to minimize the cost of resources required to meet demand.

**Sales and operations planning** A term that refers to the process that helps companies keep demand and supply in balance. The terminology is meant to capture the importance of cross-Functional work.

**Long-range planning** Activity typically done annually and focusing on a horizon of a year or more.

**Intermediate-range planning** Activity that usually covers a period from 3 to 18 months with weekly, monthly, or quarterly time increments.

**Short-range planning** Planning that covers a period less than six months with either daily or weekly increments of time.

**Production rate** The number of units completed per unit of time.

**Workforce level** The number of production workers needed each period.

**Production planning strategies** Plans that involve trade-offs among workforce size, work hours, inventory, and backlogs.

**Pure strategy** A plan that uses just one of the options available for meeting demand. Typical options include chasing demand, using a stable workforce with overtime or part-time work, and constant production with shortages and overages absorbed by inventory.

**Mixed strategy** A plan that combines options available for meeting demand.

**Yield management** Allocating the right type of capacity to the right type of customer at the right price and time to maximize revenue or yield.

**Material requirements planning (MRP)** the logic for determining the number of parts, components, and materials needed to produce a product. MRP also provides the schedule specifying when each of these materials, parts, and components should be ordered or produced.

**Master production schedule (MPS)** A time-phased plan specifying how many and when the firm plans to build each end item.

**Available to promise** A feature of MRP systems that identifies the difference between the number of units currently included in the master schedule and actual (firm) customer orders.

**Bill of materials (BOM)** A computer file that contains the complete product description, listing the materials, parts, and components and the sequence in which the product is created.

**Net change system** An MRP system that calculates the impact of a change in the MRP data (the inventory status, BOM, or master schedule) immediately. This is a common feature in current systems.

**Closed-loop MRP** The use of actual data from the production system to continually update the MRP system. This feedback is provided so that planning can be kept valid at all times.

**Manufacturing resource planning (MRP II)** An expanded version of MRP that integrates finance, accounting, accounts payable, and other business processes into the production scheduling and inventory control functions that are part of a basic MRP system

**Inventory Management**

**Inventory** The stock of any item or resource used in an organization.

**Independent demand** The demands for various items are unrelated to each other.

**Dependent demand** The need for any one item is a direct result of the need for some other item, usually an item of which it is a part.

**Fixed-order quantity model (or Q-model)** An inventory control model where the amount requirement is fixed and the actual ordering is triggered by inventory dropping to a specified level of inventory.

**Fixed-time period model (or P-model)** An inventory control model that specifies inventory is ordered at the end of a predetermined time period. The interval of time between orders is fixed and the order quantity varies.

**Inventory position** The amount on hand plus on-order minus backordered quantities. In the case where inventory has been allocated for special purposes, the inventory position is reduced by these allocated amounts.

**Safety stock** The amount of inventory carried in addition to the expected demand.

**Cycle counting** A physical inventory-taking technique in which inventory is counted on a frequent basis rather than once or twice a year.

**Stock keeping unit (SKU)** A common term used to identify an inventory item..

**Supply Chain Management**

**Bar Code:** A symbol consisting of a series of printed bars representing values. A system of optical character reading, scanning, and tracking of units by reading a series of printed bars for translation into a numeric or

alphanumeric identification code. A popular example is the UPC code used on retail packaging.

**Bar code scanner:** A device to read bar codes and communicate data to computer systems.

**Benchmarking:** The process of comparing performance against the practices of other leading companies for thepurpose of improving performance. Companies also benchmark internally by tracking and comparing currentperformance with past performance. Benchmarking seeks to improve any given business process by exploiting "bestpractices" rather than merely measuring the best performance. Best practices are the cause of best performance.Studying best practices provides the greatest opportunity for gaining a strategic, operational, and financialadvantage.

**Cost, Insurance, Freight (CIF):** A trade term requiring the seller to arrange for the carriage of goods by sea to aport of destination, and provide the buyer with the documents necessary to obtain the goods from the carrier.

**Consignee:** The party to whom goods are shipped and delivered. The receiver of a freight shipment.

**Consignment**: The act of consigning— placing a person or thing in the possession of another, but retainingownership until the goods are sold. This may apply to shipping or sale in a store (i.e., a consignment shop).

**Consignment Inventory:** 1) Goods or product that are paid for when they are sold by the reseller, not at the time they are shipped to the reseller. 2) Goods or products which are owned by the vendor until they are sold to the consumer.

**Consignor:** The party who originates a shipment of goods (shipper). The sender of a freight shipment, usually the seller

**Cross Dock / Cross Docking (XDK)**: A distribution system in which merchandise received at the warehouse or distribution center is not put away, but instead is readied for shipment to retail stores. Cross docking requires close synchronization of all inbound and outbound shipment movements. By eliminating the put-away, storage and selection operations, it can significantly reduce distribution costs.

**General Agreement on Tariffs and Trade (GATT)**: The General Agreement on Tariffs and Trade started as an international trade organization in 1947, and has been superseded by the World Trade Organization (WTO). GATT (the agreement) covers international trade in goods. An updated General Agreement is now the WTO agreement governing trade in goods. The 1986-1994 "Uruguay Round" of GATT member discussions gave birth to the WTO and also created new rules for dealing with trade in services, relevant aspects of intellectual property, dispute settlement, and trade policy reviews. GATT 1947: The official legal term for the old (pre-1994) version of the GATT. GATT 1994: The official legal term for new version of the General Agreement, incorporated into the WTO, and including GATT 1947.

**Global Positioning System (GPS):** A system which uses satellites to precisely locate an object on earth. Used by trucking companies to locate over-the-road equipment.

**Logistics Management**: As defined by the Council of Supply Chain Management Professionals (CSCMP): "Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. Logistics management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfillment, logistics network design, inventory management, supply/demand planning, and management of third party logistics services providers. To varying degrees, the logistics function also includes sourcing and procurement,production planning and scheduling, packaging and assembly, and customer service. It is involved in all levels of planning and execution-strategic, operational, and tactical. Logistics management is an integrating function which

coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions,including marketing, sales, manufacturing, finance, and information technology."

**Supply Chain:** 1) starting with unprocessed raw materials and ending with the final customer using the finished goods, the supply chain links many companies together. 2) the material and informational interchanges in the logistical process stretching from acquisition of raw materials to delivery of finished products to the end user. All vendors, service providers and customers are links in the supply chain.

**Quality Management**

**Total quality management (TQM)** Managing the entire organization so that it excels on all dimension of products and services that are important to the customer.

**Malcolm Baldrige National Quality Award** An award established by the U.S. Department of Commerce and given annually to companies that excel in quality.

**Design quality** The inherent value of the product in the marketplace.

**Conformance quality** The degree to which the product or service design specifications are met.

**Quality of the source** The person who does the work in responsible for ensuring that specifications are met.

**Dimensions of quality** Criteria by which quality is measured.

**Cost of quality** Expenditures related to achieving product or service quality such as the costs of prevention, appraisal, internal failure, and external failure.

**Six Sigma** A statistical term to describe the quality goal of no more than four defects out of every million units. Also refers to a quality improvement philosophy and program.

**DPMO (defects per million opportunities)** A metric used to describe the variability of a process.

**DMAIC** An acronym for the **D**efine, **M**easure, **A**nalyze, **I**mprove, and **C**ontrol improvement methodology followed by companies engaging in Six-Sigma programs.

**PDCA cycle** Also called “The Deming cycle or wheel”; refers to the plan-do-check-act cycle of continuous improvement.

**Continuous improvement** The philosophy of continually seeking improvements in process through the use of team efforts.

**Kaizen** Japanese term for continuous improvement.

**Lean Six Sigma** Combines the implementation and quality control tools of Six Sigma with the materials management concept of lean manufacturing with a focus on reducing cost by lowering inventory to an absolute minimum.

**Black belts, master black belts, green belts** Terms used to describe different levels of personal skills and responsibilities in Six-Sigma programs.

**Fail-safe or poka-yoke procedures** Simple practices that prevent errors or provide feedback in time for the worker to correct errors.

**ISO 9000** Formal standards used for quality certification, developed by the International Organization for Standardization.

**External benchmarking** Looking outside the company to examine what excellent performers inside and outside the company's industry are doing in the way of quality