

GLOSSARY

Allocated inventory (ALI) Untouchable inventory set aside for and dedicated to specific customers, channels, purposes, and/or business units.

Annual demand (AD) The number of units requested for an item during a year. It looks backward over the prior year and is strictly historic.

Assemble to order (ATO) An inventory, logistics, and supply chain concept made famous by Dell Computer in which assembly is delayed or postponed until an order is received.

Available inventory (AVI) On-hand inventory minus allocated or committed inventory:

$$AVI = OHI - ALI \text{ or } AVI = OHI - CMI$$

Average inventory level (AIL) The average number of units in inventory, including safety stock inventory, lot size inventory, and lead time inventory:

$$AIL = SSI + (LS/2) + [L \times (FAD/365)]$$

Average inventory value (AIV) The average investment in inventory, including safety stock inventory, lot size inventory, and lead time inventory:

$$AIV = AIL \times UIV$$

Average lead time demand (ALD) The average demand during a lead time:

$$ALD = L \times (FAD/365)$$

Average replenishment quantity (ARQ) The average size of lot size replenishments; derived by dividing the total replenishment quantity over a particular period by the number of replenishments received during that time.

Bill of material (BOM) A hierarchical assembly structure.

Buckets of Inventory (BOI) A reference to the purposeful allocation, tracking, and planning for inventory in three distinct buckets: safety stock inventory (SSI), lot size inventory (LSI), and pipeline inventory (PI).

Changeover cost (COC) The cost to set up (prepare or change over) a machine or production line to make a production run for a particular item or to change between items.

Committed inventory (CMI) Untouchable inventory held specifically or allocated specifically for customers, business units, and/or channels of business.

Consignment inventory (CSI) Inventory that is physically on the premises but not fiscally on the books; it is still owned by and sometimes managed by the vendor. Hence, this inventory is sometimes referred to as vendor-managed inventory (VMI).

Contingency and disaster inventory (CDI) Exists to cover unexpected situations outside the realm of those covered by traditional safety stock inventory. Those situations include scenarios such as natural disasters, labor strikes, and other exceptional supply chain disruptions.

Days on hand (DOH) The ratio of the average inventory value (AIV) to current forecast daily usage:

$$\text{DOH} = \text{AIV}/(\text{FAD}/365)$$

Economic order quantity (EOQ) Manufacturing EOQ is the run quantity or batch size that minimizes the sum total of inventory carrying cost and

setup cost. Procurement EOQ is the purchase quantity that minimizes the sum total of inventory carrying cost and procurement cost:

$$\text{EOQ} = [(2 \times \text{FAD} \times \text{SUC}) / (\text{UIV} \times \text{ICR})]^{1/2}$$

Fill rate (FR) The percentage of customer demand that can be satisfied from on-hand inventory.

Forecast annual demand (FAD) (1) The forecast annual demand for an item. (2) The predicted demand in units for the upcoming 12-month period. (3) The forecast (or expected) annual number of units requested by customers.

Forecast lead time demand (FLD) Forecast demand during a lead time:

$$\text{FLD} = L \times (\text{FAD}/365)$$

Gross margin return on inventory (GMROI) The financial return on inventory investments expressed as the ratio of the annualized gross margin to the average inventory investment:

$$\text{GMROI} = \text{GM}/\text{AIV} = [(\text{USP} - \text{UIV}) \times \text{FAD}] / \text{AIV}$$

Hedge inventory (HDI) (1) Inventory purchased as a hedge against potential price increases. (2) Inventory that exists to cover potential sharp price increases and/or shortages in critical commodities.

Inventory carrying cost (ICC) The annualized cost of carrying inventory:

$$\text{ICC} = \text{AIV} \times \text{ICR}$$

Inventory carrying rate (ICR) The percentage per year applied to average inventory value to annualize the cost of carrying inventory, usually including opportunity cost of capital, storage, handling, insurance, taxes, obsolescence, loss, and damage.

Inventory Policy Cost (IPC) The sum of inventory carrying cost and lost sales cost:

$$\text{IPC} = \text{ICC} + \text{LSC}$$

Inventory quality ratio (IQR) The percentage of the total inventory investment that is in active SKUs. This is a very helpful indicator of inventory performance, acting much like a bad debt ratio for banks:

$$\text{IQR} = (\text{AIV active})/\text{AIV}$$

Inventory turn ratio (ITR) The number of times inventory turns each year; typically expressed as the ratio of annual sales at cost to average inventory value:

$$\text{ITR} = (\text{FAD} \times \text{UIV})/\text{AIV}$$

Inventory Value Added (IVA) An EVA-like metric applied to inventory:

$$\text{IVA} = \text{GM} - \text{ICC}$$

Lead time (L) Manufacturing lead time is the elapsed time from when a manufacturing order is released to the factory until product is available for sales from manufacturing. Procurement lead time is the elapsed time from when an order is released to a vendor until the product is available for sales.

Lead time demand (LD) Demand during a lead time:

$$\text{LD} = L \times (\text{FAD}/365)$$

Lead time forecast error percentage (LFEP) The absolute value of the forecast error percentage over a lead time.

Life cycle inventory (LCI) Life cycle inventory models allocate inventory to categories on the basis of product maturities. Typical maturities include (1) conception, (2) infancy, (3) adolescence, (4) maturity, (5) decline, (6) discontinue, and (7) burial.

Logistics The flow of material, information, and money between consumers and suppliers.

Lost sales (LS) Occur when unsatisfied demand is lost. Lost sales are common in retail situations in which there are many alternative outlets for a product.

Lost sales cost (LSC) The potential sales lost because of out of stocks:

$$\text{LSC} = [\text{FAD} \times \text{USP}] \times (1 - \text{UFR}) \times \text{SF}$$

Lot size (LS) Also known as the replenishment quantity (RQ) or the cycle stock (CS). The number of units that arrive in a replenishment lot or are produced in a manufacturing lot.

Maximum inventory level (MIL) The sum of the economic order quantity, safety stock, and lead time inventory:

$$\text{MIL} = \text{SSI} + \text{EOQ}$$

Net inventory (NI) On-hand inventory minus units on back order (UOB):

$$\text{NI} = \text{OHI} - \text{UOB}$$

Non-value-added inventory (NVAI) Nonworking, excess inventory. Inventory that is not adding value as safety stock inventory, lot size inventory, or pipeline inventory:

$$\text{NVAI} = \text{TIL} - \text{VAI}$$

On-hand inventory (OHI) (1) The most common inventory reference. (2) The number of units of inventory physically on hand in storage.

Order up to level (OUL) The level of inventory a replenishment quantity should yield when it is placed.

Out of stock (OOS) Stockout situation covered by lost sales, substitution, or back order.

Purchase order cost (POC) The cost of planning, placing, tracking, and paying for a purchase order. Used in economic order quantity computation.

Raw material inventory (RMI) Inventory that has not been converted, changed, processed, or in any way changed in value.

Reorder point (ROP) The inventory position at which an order is placed. Normally is equal to the safety stock plus the average lead time demand:

$$\text{ROP} = \text{SSI} + \text{LD}$$

Replenishment cycle time (RCT) The elapsed time between replenishments. The annual number of replenishments is 365 days divided by the average elapsed time between replenishments.

Return on invested capital (ROIC) The ratio of operating profit to invested capital. It encompasses all the elements of revenue, expense, and capital.

Review time period (RTP) The time between inventory reviews.

Safety stock inventory (SSI) Literally the amount of stock on hand when a replenishment arrives. Safety stock is a function of forecast error, desired fill rate, and inbound delivery reliability. The model sets safety stock to the product of the normal inventory value associated with the desired fill rate and the standard deviation of lead time demand.

Seasonality and build inventory (SBI) Exists to level production and machine, line, and plant utilization.

Setup cost (SUC) The cost to set up (prepare or change over) a machine or production line to make a production run for a particular item or a change between items. It is sometimes referred to as the changeover cost (COC). Used in economic order quantity computation.

Shortage factor (SF) The percentage of the unit selling price lost when out of stock. The default value is set as the margin percent. Used in lost sales cost computation.

Standard deviation of lead time demand (SDLD) A measure of the variability of lead time demand.

Stock keeping unit (SKU) A number or set of alphanumeric characters that reference a unique part or item; sometimes called a part number.

Supply chain (SC) The infrastructure of factories, warehouses, ports, information systems, highways, railways, terminals, and modes of transportation connecting consumers and suppliers.

Supply chain logistics (SCL) The flow of material, information, and money in the infrastructure of factories, warehouses, ports, information systems, highways, railways, terminals, and modes of transportation connecting consumers and suppliers.

Unit fill rate (UFR) The percentage of total units requested by customers that can be satisfied from on-hand inventory.

Unit gross margin (UGM) The difference between the unit selling price and the unit inventory value. The higher the unit gross margin, the higher the cost of lost sales associated with a particular item:

$$\text{UGM} = \text{USP} - \text{UIV}$$

Unit inventory value (UIV) The unit cost of manufacturing (sometimes referred to as standard cost) or the unit cost of purchase (sometimes referred to as unit cost of goods sold).

Unit selling price (USP) The price per unit paid by a customer for an item.

Units on back order (UOB) The number of units outstanding on back orders.

Value-added inventory (VAI) (1) Inventory that is adding value, such as safety stock that mitigates demand variability risk, lot size inventory that offsets setup and ordering costs, and pipeline inventory that corresponds to lead times.

(2) All inventory that is not excess or waste. (3) The difference between total inventory and value-added inventory:

$$\text{VAI} = \text{TI} - \text{NVAI}$$

Vendor-managed inventory (VMI) Inventory managed by and procured for a company by vendors.

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Logistics Resources International is a supply chain consulting, professional education, and analytics firm. The firm was founded by Dr. Ed Frazelle to help organizations develop and implement supply chain strategies that maximize their financial, service, and operational performance.

Based on LRI's proprietary RightChain model of supply chain strategy, LRI offers supply chain consulting, supply chain seminars, decision support programs, and publications on supply chain strategy, customer service, inventory management, sourcing, transportation, and warehousing. To date, our clients have put more than \$5 billion on their bottom lines through LRI projects. Our consulting programs have helped a number of clients receive their industries' most prestigious awards for supply chain excellence. Our principals are the leading subject matter experts in their fields, serving clients simultaneously as consultants, facilitators, and teachers.

We serve our clients from offices in Atlanta, Georgia (LRI Global Headquarters and LRI North America); Tokyo, Japan (LRI Asia Pacific); and San José, Costa Rica (LRI Latin America) and through affiliates in Sydney, Australia, and Lima, Peru.

ABOUT RIGHTCHAIN



Based on more than two decades of supply chain strategy consulting, executive education, and research, the RightChain program includes the definitions, methodology, tools, curricula, principles, metrics, processes, and delivery mechanism required to address the major decisions in supply chain strategy development. RightChain is successfully guiding the supply chains of large, medium-size, and small companies in nearly every major industry around the world and is responsible for more than \$5 billion in bottom-line impact through optimized combinations of sales increases, expense reductions, and capital utilization improvement. RightChain typically puts between 1% and 5% of sales on the bottom line. It has been taught to more than 10,000 supply chain professionals in seven languages around the world.