

Lean Glossary

6 Sigma: A scientific/data-driven approach for achieving 6 standard deviations between the mean and nearest specifications limit. Six Sigma methods can be applied to all aspects of manufacturing, transactional processes, and virtually any form of work or processing.

Andon: A type of visual control that displays the current state of work (i.e., abnormal conditions, work instructions, and job progress information). It is one of the main tools of Jidoka.

Bottleneck: The slowest operation (choke point) in a manufacturing process.

BTO (Build-to-Order): The manufacturing process where items are produced to order based on actual customer demand and configuration options.

BTR (Build-to-Replenish): The manufacturing process where items are scheduling for production based on actual shipment from finished goods inventory.

Capacity: The ability of a machine and its operator to complete the work required.

Changeovers: Switching from producing one part/product to another is generally known as a changeover.

Constraint: Taken from (TOC) "Theory of Constraints" A constraint is anything that limits a system from achieving higher performance versus its goal.

Continuous Improvement: The ongoing process/philosophy of doing things better, faster, and cheaper.

Continuous Flow: Moving products through a production system without separating them into lots.

Current State or "As Is" Map: Taken from Value Stream Mapping, (VSM) the "Current State Map" shows the value stream or process map as it is operating right now.

Cycle Time: The time it takes to do one repetition of any particular task typically measured from "Start to Start" the starting point of one product's processing in a specified machine or operation until the start of another similar product's processing in the same machine or process.

Demand Management (Demand Forecasting): Prediction of the levels of weekly or monthly product activity over a specified time (generally about two years).

Enterprise Resources Planning (ERP): Taking the needs of an entire organization into account ERP is essentially an extension of "MRP" "Manufacturing Resources Planning" which attempts to ascertain needs and abilities of a company system.

Genchi Genbutsu: Go see the problem. This is the belief that practical experience is valued over theoretical knowledge. You must see the problem to know the problem.

Heijunka: The overall leveling, in the production schedule, of the volume and variety of items produced in given time periods. Heijunka is a pre-requisite for Just-in-time delivery.

Hoshin: Goals (with targets) and means for achieving it to address business priorities to move the organization to a new level of performance; variable from year-to-year; could also be multi-year; and is developed by executive management.

Inventory (Finished Goods): This is the most expensive type of inventory as the materials have already traveled through the value stream and are now complete.

Inventory (Raw Material): Un-processed components waiting for work to be done on them. This is the least expensive form of inventory especially if suppliers will wait for payment until you begin using these materials.

Inventory (Work In Process or WIP): Materials that have had some work done to them but are not yet finished.

Inventory Turns: The number of times you can "Turn" (use and replace) your inventory/money over in a year.

Jidoka: One of the two main pillars of TPS. It refers to the ability to stop production lines, by man or machine, in the event of problems such as equipment malfunction, quality issues, or late work. Jidoka helps prevent the passing of defects, helps identify and correct problem areas using localization and isolation, and makes it possible to "build" quality at the production process.

Jishuken: Management driven kaizen activity where management members identify areas in need of continuous improvement and spread information through the organization to stimulate kaizen activity.

Just-in-Time (JIT): The second main pillar of the Lean Enterprise System is "Just -In-Time." This is the principle that the materials should be delivered to the job site in the correct quantities at the correct time. Production and conveyance of only what is needed, when it is needed, and in the quantity needed. This meets the exact demands of the customer in terms of product requirements, timing, volume, and variety.

Kaizen: A system of continuous improvement in which instances of Muda (waste) are eliminated one-by-one at minimal cost. This is performed by all employees rather than by specialists.

Kanban: Visual tools that are based on actual usage. Kanbans provide production planning, they put a cap on inventory and insure that there will be sufficient parts. Kanbans can be cards, empty means of conveyance or colored ping pong balls. Kanbans are used to connect assembly lines to internal processes that require changeovers such as machining lines.

Lead- Time: The time required from receipt of order until products are shipped to a customer.

Lean Enterprise: (a.k.a. Lean Manufacturing) An organization that is engaged in the endless pursuit of waste elimination in all of its' activities.

Lean Manufacturing (Lean Production): A manufacturing/production system best characterized as relentlessly eliminating waste from all of its' activities and operations. Lean strives to produce products On-Time, Using as few resources as possible, better than competitors, and faster & cheaper than competitors.

Manufacturing Execution System (MES): A networked computing system used to automate production control and process automation through intercommunication between production scheduling, work scheduling and production throughput to bridge gaps that might appear between these functions.

Manufacturing Resources Planning (MRP II): A computerized method for planning the use of a company's resources, such as scheduling raw materials, suppliers/vendors, production equipment and processes.

Mass Customization: A production system that stresses the production of relatively small lots of customized or somewhat unique goods.

Mass Production: Large-scale, generally very standardized manufacturing practice with high-volume production and output.

Master Schedule: Overall sequenced schedule of multiple orders through a factory.

Materials Handling: The function of moving objects from one location to another.

Materials Requirements Planning (MRP): Using software, materials planning is accomplished through evaluating the Bill of Materials (BOM), Inventory Data, and the Master Schedule in order to stimulate replenishment of materials to be consumed and present purchase orders (PO's) for future materials needed.

Muda: Non-value added. Muda is translated as waste. There are seven types of muda: (Overproduction, waiting, conveyance, processing, inventory, motion, correction).

Nemawashi: Preliminary work to involve other sections/departments in discussions to seek input, information and/or support for a proposal or change (policy, etc.) that would affect them..

Operations: A broad term suggesting administrative responsibilities and duties related to office functions, manufacturing, procurement, distribution, various management issues, and global accountability.

OEE (Overall Equipment Effectiveness): A metric that measures the availability, performance efficiency, and quality rate of your equipment.

Pokayoke: Low cost, highly reliable devices, used in the jidoka system, that will stop processes in order to prevent the production of defective parts.

Product Quantity (PQ) Analysis: A tool that helps employees understand the types of products your organization produces and the volume that your customers demand.

Productivity: The scaled amount of benefit realized as derived from inputs.

Pull System: A production system in which goods are built only when requested by a downstream process.

Push System: A production system in which goods are produced and handed off to a downstream process, where they are stored until needed.

Standardized Work: The Toyota Production System organizes all jobs around human motion and creates an efficient production sequence without any "Muda." Work organized in such a way is called standardized work. It consists of three elements: Takt-Time, Working Sequence, and Standard In-Process Stock.

Supply Chain Management: The tool used to pass data and expectations between suppliers and customers with the primary purpose for the customers being to have what is needed, in the quantity and quality needed, and at the lowest possible price.

Takt Time: "Takt-Time" is the time which should be taken to produce a component on one vehicle. This timing mechanism is based on the monthly production schedule. Daily total operating time is figured on the basis of all machinery operating at 100% efficiency during regular working hours. The takt time allows us to produce many parts of many different types for use in vehicles on the production schedule and to supply those parts to each process on the assembly line at the proper time. This keeps production on schedule and permits flexible response to change in sales. $\text{Take Time} = (\text{Straight Time Work Time}) / (\text{Required Number of Production based on Demand})$

Throughput: The rate at which work proceeds through a manufacturing system.

Tier 1 Supplier(Prime Contractor, Prime): A supplier with prime or paramount design responsibilities for key systems, subsystems, or components as pertaining to end product(s).

Total Quality Management (TQM): A Quality Control System focused on the correction of quality issues before they are permitted to subsequently be passed on for further processing. TQM systems are often "built-in" to manufacturing processes.

TPM (Total Productive Maintenance): TPM is an equipment maintenance system that proactively addresses maintenance issues before they become major problems and cause equipment downtime.

Working Sequence: Working Sequence refers to the sequence of operations in a single process which leads a floor worker to produce quality goods efficiently and in a manner which reduces overburden and minimizes the threat of injury or illness.

Yokoten: Across everywhere. (Plant related activities and/or countermeasures that are communicated plant wide and with other company affiliates.