

Glossary of Terms

Actual Cost

In Target Value Design, the documented costs of actually performing a portion of work or an entire project based upon agreed definitions of cost, overhead and profit.

Allowable Cost

The maximum amount the Owner is willing and able to spend for a facility asset.

Batch

An accumulation of work produced by a trade, discipline or other specialist that moves as a unit. The goal of lean is to produce a batch size of one to achieve "single piece flow". Leading to the mantra: "Flow where you can. Pull where you can't. Push where you must."

Black Belt

Individual certification of full-time facilitators for long-term projects (four to nine months) or Kaizens (two to five days) using Lean Six Sigma methodology. Black Belts also can coach Green Belts and the A3 process.

Choosing by Advantage (CBA)

Choosing by Advantage is a tested and effective decision-making system developed by Jim Suhr for determining the best decision by looking at the advantages of each option. CBA's five phases of decision-making: (1) Stage-setting: establish the purpose and context for the decision; (2) Innovation: formulate an adequate set of alternatives; (3) Decision-making: choose the alternative with the greatest total importance of advantages; (4) Reconsideration: change the decision if it should be changed or improved on; and (5) Implementation: make the decision happen, adjust as needed, and evaluate the process and results.

Commitment-Based Planning

A planning system that is based on making and securing reliable promises in a public setting.

Conditions of Satisfaction

A directive or set of criteria that specifies how the success of the outcome will be gauged.

Conceptual Design

The phase of the project that determines WHAT is being built. Deliverables include: program, technology plan, target cost budget, performance metrics, conditions of satisfaction and milestone schedule.

Constraint

Something that stands in the way of a task being executed.

Continuous Flow

Work that proceeds without interruption or waste.

Criteria Design

This term is from AIA IPD terms: The project phase where the project begins to take shape. Deliverables include: set-based design studies evaluated and studied by IPD team; real-time

estimating; defined scope/target cost approval; more developed schedule; and, quality review of constructability of design.

Customer

The primary recipient of the output from processes. In Lean Six Sigma, the terms "customer", "external customer" or "end user" describes individuals and organizations that pay for and receive products and services. The terms "customer", "internal customer" or "process partner" often are used at the project level to describe those parts of the organization that internally receive the output from process being improved.

Cycle Time

The time it takes a product or unit of work (i.e., a room, building, quadrant) to go from beginning to completion of a production process.

Detailed Design

This term is from the AIA IPD terms: This project phase concludes the WHAT phase of the project. Deliverables include: approved documents with decisions defined; definition of all major building systems including furniture, fixtures and equipment; and, coordination and full engineering of all building elements. Also: Sub trades are ready to start shop drawings: construction quality review and outline; and products are established and vetted for specifications.

Enabling Projects

The many and multiple secondary projects required to be accomplished before the primary project can be undertaken.

Error Proofing

Describes when it is near impossible for an error to occur. Examples in healthcare are dialysis machines that allow only flow out of the patient; Leur locks that allow only certain syringes to attach to be attached; and enteral feeding tubes that will not attach to IV machines.

Expected Cost

An expression of the team's best estimate at the conclusion of the Validation Phase of what current best practice would produce as a price for the facility reflected in the accompanying basis of design documents. Typically, the Expected Cost will also be supported by benchmarking or other market data to calibrate the Expected Cost in light of the market context.

Evidence-Based Design

Evidence-Based Design represents a model of design practice characterized by the use and generation of scientific evidence to support decision-making.

First-Run Study

Trial execution of a process in order to determine the best means, methods, sequencing etc., to perform it. First-run studies are done at least a few weeks ahead of the scheduled execution of the process, while there is time to acquire different or additional prerequisites and resources. They may also be performed during design as a basis for evaluating options or designing the portion of the work.

Five Big Ideas

A set of organizing concepts that support Lean Project Delivery. They were developed to explain and organize the Sutter Health Lean Construction Initiative: Optimize the project not the piece;

Collaborate, Really Collaborate (originally implied "specialty contractors involved at the schematic design"); Projects as Networks of Commitment; Increase Relatedness; and Tightly Couple Action and Learning.

Fishbone Diagram

A tool used to identify and organize possible causes of a problem in a structured format. It looks like the skeleton of a fish, with the head of the fish used as the main problem in question and the body to signify the causes. It also can be used as a tool for capturing the ideas of a team.

Future State Value Stream Map

Taking the Current State value stream map and seeing how it should look in an ideal world, eliminating steps and getting rid of waste.

Gemba

The Japanese term for workplace, i.e., where the work is actually getting done. Lean experts encourage "going to the Gemba" to see how things are really done and where there is opportunity to eliminate or reduce waste.

Green Belts

Individual certification of part-time facilitators of long-term projects (four to nine months) or Kaizens (two to five days) that are of strategic importance to the organization using Lean Six Sigma methodology. These staff members can also coach on A3 development and help with Black Belt project initiatives.

Hand-off

The act of releasing an item or activity to the person or group performing the next step or operation on that item or activity, e.g., a structural steel design is "handed off" to the steel detailer to complete shop drawings; a room (or portion) that has been framed is "handed off" to the drywall installer; or all construction on a floor of a hospital is completed and it is "handed off" to the hospital personnel to begin staff-and-stock activities.

Implementation Documents

This term is from the AIA IPD terms. During this phase, focus shifts from the WHAT is being created to documenting HOW it will be implemented. Deliverables include: Coordinated BIM model; shop drawings for some trades; specifications; and the drawings required to define: procurement, assembly, layout, schedule, procedural information and legal requirements.

Integrated Project Delivery

A project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of the project, from early design through project handover.

Inventory

Stock on hand-often divided between raw materials inventory, work-in-progress and finished goods inventory.

Kaizen

Japanese term for the philosophy of incremental, continuous improvement.

Kanban

A signal that usually is visual. Generally, it signals that it is time to do work, or that the next step in the process needs to be done. Examples include tape on the counters signaling that a specimen or prescription is done or flags on the doors to exam rooms that a patient is ready to be seen. A Kanban also can be a signal to trigger replenishment in N inventory control system.

Last Planner®

The person or group that makes assignments to direct workers. "Squad boss" and "discipline lead" are common names for the last planners in design processes. "Superintendent" (if a job is small) or "foremen" are common names for last planners in construction processes.

Last Planner® System

The collaborative, commitment-based planning system that integrates should-can-will-did planning (pull planning, make-ready look-ahead planning with constraint analysis weekly work planning based on reliable promises, and learning based upon analysis of PPC and Reasons for Variance).

Last Responsible Moment

Delaying commitment until the last responsible moment, that is, the moment at which failing to make a decision eliminates an important alternative. If commitments are delayed beyond the last responsible moment, then decisions are made by default, which is generally not a good approach to making decisions.

Lean

Culture of respect and continuous improvement aimed at creating value for the customer by identifying and eliminating waste.

Lean Project Delivery System (LPDS)

LPDS represents the development and delivery of a project from determining that which helps the clients better achieve their business purposes through final use. Positive iterations are encouraged within each phase so as to prevent negative iteration between the phases. Production control, work structuring and learning are continuing functions.

Load

The utilization of a resource. The amount of output expected from a production unit or individual worker within a given time. Within a weekly work plan, what is to be accomplished by a design squad or individual designer, engineer, draftsman, construction craft worker, crew, etc. A quality assignment "loads" a resource within its capacity.

Look Ahead Planning

A short interval plan (usually based on the pull/phase) that identifies all the activities to be performed in the next six weeks. The 6W Look Ahead Schedule (LAS) is updated each week and always identifies new activities coming six weeks out so that the project management team can make appropriate arrangements to cause that the work will be ready to be performed in the week indicated.

When an Activity cannot be advanced, the reason why is identified and listed as a constraint. The 6W LAS typically have been prepared as an Excel spreadsheet, but it may also be captured using one of the scheduling software packages.

The output of look-ahead planning is a list of constraints and individual commitments to remove those constraints meeting the follow-on trade's Condition of Satisfaction.

Look Ahead Window

The duration associated with Look Ahead Planning. Typically look-ahead windows extend from three to 12 weeks into the future, with six weeks preferred on most projects. Reducing the look-ahead period normally will increase inventory pushed to site organization.

Master Schedule

A schedule that identifies major events in a project (start-up, turn-over to client, order long delivery components, mobilize in field, complete design, government reviews, etc.) and their timing. It is the basis for contractual agreements between the Owner and other team members. It is seen as a way to identify long lead items, the feasibility of completing the project as currently required, the basis for defining milestones and phases- but not as a way to "control" the project.

Milestone

An item on the Master Schedule that defines the end or beginning of a phase or a contractually required event.

Muda

A Japanese word for "non-value-added" or Ohno's 7 Wastes +1.

Mura

A Japanese word for "unevenness" - fluctuation in demand that causes the workflow to be uneven.

Miri

A Japanese word for "overburdening" excessive demand on a system that causes the system to produce beyond its reasonable capacity. Pushing a machine or person beyond natural limits. Overburdening people results in safety and quality problems. Overburdening equipment causes breakdowns and defects.

Network of Commitments

The web of promises necessary to deliver any project. The role of management is to articulate and activate the unique network of commitments required to deliver each project.

Non-value Added

Tasks or activities that the organization performs that the customer does not value and (if given the choice) is not willing to pay for.

PDCA Cycle

Stands for Plan - Do - Check - Act. The cycle introduced by Walter A. Shewhart and popularized by Dr. W.E. Deming as a method of continuous improvement.

PICK Chart

An Ease/Impact chart that segregates ideas into Possible, Implement, Challenge and Kibosh categories.

Plan Reliability

The extent to which a plan is an accurate forecast of future events, measured by PPC. Example: If your weekly work plans have a 60%PPC, they accurately predict completion/release of 60% of the tasks represented as weekly assignments.

Plus/Delta Review

A discussion done at the end of a meeting, project or event used to evaluate the session or activity. Two questions are asked and discussed: What worked or produced value during the session? What could we do different/better next time to improve the process or outcome?

Poke Yoke

A mistake-proofing method or device developed by Shigeo Shingo that is used to prevent an error or defect from happening or being passed on to the next operation.

PPC (Plan Percent Complete)

A basic measure of how well the planning system is working-calculated as the number of assignments completed on the day stated divided by the total number of assignments made for the week. In many cases the PPC will be less than 50% when a project starts to monitor the PPC and will rise to 80% or 90% as the team becomes conscious of the need to actually perform work as planned. PPC is not a form of Earned Value that measures the percentage of completion achieved for an activity; rather it measures the percentage of assignments that are 100% complete.

Process

A sequential series of tasks, activities, decisions and events that generate a product or service.

Process Map

A flowchart identifying all the activities, operations, steps and work times for a process.

Process Owner

The individual(s) ultimately responsible for the process; the Director, Manager or Supervisor of the department.

Promise

The action taken by a speaker (Performer) to commit to a listener (customer) to take some action to produce a mutually understood result (Conditions of Satisfaction) by a definite time in the future. (See Reliable Promise).

Pull

A method of advancing the wherewithal necessary for work when the next-in-line customer is ready to use it. A request from the customer signals that the work is needed and is pulled from the performer. Pull releases work when the system is ready to use it.

Push

An order from a central authority based on a schedule; advancing work based on central schedule. Releasing materials, information or directives, possibly according to a plan but irrespective of whether or not the downstream process is ready to process them.

Pull Plan

A plan for executing a specific phase of a project using a pull technique to determine hand-offs. Typically it is prepared by the team actually responsible for doing the work-engineers, architects, owners, and designers for a "design phase", designers, specialty contractors, GC for a "construction phase." The team members start at the conclusion of the phase and work backwards, at each step identifying the requirements to declare a chunk of work complete and their needs to start that chunk. Many times it is performed by pasting descriptions of the chunks of work on a wall, establishing

durations and efficient work flow pattern and then capturing the final solution in Visio or project management software.

Quality

Conformance to a customer's valid and agreed upon Conditions of Satisfaction.

Request

The action taken by a speaker (customer) to ask a listener (performer) to take some action to produce a mutually understood result (Conditions of Satisfaction) by a definite time in the future.

Reliable Promise

A promise made by a Performer only after self-assuring that the promisor (1) is competent or has access to the competence (both skill and wherewithal); (2) has estimated the amount of time the task will take; (3) has blocked all time needed to perform; (4) is freely committing and is not privately doubting ability to achieve the outcome; and (5) is prepared to accept any upset that may result from failure to deliver as promised.

Root Cause Analysis

A systematic method of analyzing possible causes to determine the root cause of a problem. (Also see 5 Whys).

Set-Based Design

Once bubble diagrams are defined, set-based design begins. Drawings begin to show room shapes, door locations, and defined people and material flow. Drawing options for room and flow are provided so the client can choose the best of each option as they are developed by the architect.

Set-based design allows for commitment to a specific solution to be postponed, allowing designers to consider multiple alternatives for longer than is typical. A design team can review sets of design alternatives available to each team participant, integrate these sets to find compatible combinations for the project as a whole, and weigh inputs from several project participants at the same time.

Spaghetti Diagram (or spaghetti chart)

A map that shows the current layout of operations and the path taken by people, the product, or the service as it moves through the process or processes, often resembling a plate of spaghetti.

Standard Work Instructions (SWI)

One of the most important Lean tools. It establishes the best current sequence for each process. It should be routinely evaluated, updated and improved. Standard work reduces chaos, achieves consensus, supports creativity, enables job rotation, stabilized the process, incorporates visual management, and provides a baseline for improvement. It is the best way that we know how a process should work currently.

Storm Clouds

Problems associated with the current condition. Any reasons for delay or failure to move onto the next step in the process could be considered storm clouds.

Target Cost

The cost goal established by the delivery team as the "target" for its design and delivery efforts. The Target Cost should be set at less than best-in-class past performance. The goal is to create a sense of necessity to drive innovation and waste reduction into the design and construction process.

Target Value Design

A disciplined management practice to be used throughout project definition, design, detailing and construction to assure that the facility meets the operational needs and values of the users; is delivered within the allowable budget; and promotes innovation throughout the process to increase value and eliminate waste (time, money, human effort).

Total Productive Maintenance (TPM)

A consistent system established for maintaining and servicing equipment that minimizes downtime (i.e., establishing a regular preventative schedule before there are equipment breakdowns).

Value (or value-added time or tasks)

Tasks or activities that the organization performs that the customer is willing to pay for. It is a step required to make the product or service function properly when used or experienced by the customer or patient.

Value Stream Map

A picture (map) of the entire process being studied; includes both material (product/service) and information flows and includes both value-added and non-value added activities. It is a tool used to identify waste within the process and identify areas of improvement. It shows values (information like timing of steps) and numbers to show objectively where improvements can be made.

Variance

When an assignment is not completed as stated, it is considered a variance from the weekly work plan.

Variability

The range of work completed each day or week.

Visual Management

Using visual cues to assist with Standard Work instructions; a visual workplace is a (non-verbal) method of sharing information. Everyone is made aware of the status of the work and is easily able to spot abnormal conditions. Could be signage for patients or tape on the counters to signal that the next step in the process needs to be done.

Voice of the Customer

Voice of the Customer is a term used to describe customers' needs and perceptions of a product or service. This is necessary for understanding the best way to meet customer or patient's needs.

Waste

Defined in the eyes of the patient/customer, anything that doesn't add value to the final product or service (i.e., unnecessary movement of people, items, or information). The 8 Types of Waste are: defects/corrections; overproduction; waiting; not using employee skills (underutilization); transportation/movement; inventory; motion; and excessive processing.

Weekly Work Plan (WWP)

The commitment-level planning document of LPS: A list promised task completions agreed upon by the Performers. The WWP is used to determine the success of the planning effort and to determine what factors limit performance. All the activities shown on the 6W LAS for the current week are

included on the WWP. In most cases they are expanded to include more detailed assignments that allow coordination between the different Performers to occur at a Weekly Work Planning Meeting.

Weekly Work Planning

The process by which the Last Planner® establishes the plan for the coming period.

Work Flow

The movement of information and materials through networks of interdependent specialists.

Workable Backlog

An activity or assignment that is ready to be performed, but is not assigned to be performed during the active week in the WWP. If the team agrees that performance of this activity will not hinder other work, then it can be placed on the list of the Workable Backlog as part of the WWP. Completion or non-completion of these activities are not recorded or counted in calculation of PPC. A reasonable amount of Workable Backlog allows Performers who are stopped from doing their assignments on the WWP or finish them early to continue work without causing harm to others; thus maintaining a reliable workflow. An example could be assignments that have met all quality criteria, except that some must yet satisfy the sequence criterion by prior execution of prerequisite work already scheduled. Other backlog assignments may be performed within a range of time without interfering with other tasks. Example: Those spare parts lists don't have to be completed for three months, but it won't harm anything if they are produced earlier, so use them as fallback or fill-in work when needed.

Work Balancing (Level Loading)

Creating a more continuous workflow by ensuring that one step in a process is not causing a delay. This is about ensuring that each step in the overall process contains similar amounts of work so that no one is overburdened and no one is waiting. Everyone is working together in a BALANCED fashion.