GLOSSARY

Module 1: Project Planning

- **Agile engineering:** A new form of product development that makes use of the iterative cycles of fast feedback and revisions first implemented in Agile software development. It encourages teams to learn about their product and make improvements faster than they could with traditional product development
- **Cognitive reframing**: The process of reconsidering events and facts to see them in a new way
- **Contingency plan**: A plan for an alternative route to project success that can be implemented if an obstacle to progress arises
- **Contingency fund**: Resources set aside to cover unanticipated costs
- **Plan**: A strategic framework for the scheduling and execution of a project. In traditional, geometric order project planning, a plan presumes events will unfold in a predictable way, with little need to update the plan. In living order project planning, the plan is always provisional and subject to change
- **Planning bias**: A cognitive bias that makes us think we can finish projects faster, and for less money, than is actually realistic
- **Project planning**: In traditional, geometric order project planning, the process of formulating the plan that will guide the rest of the project. In living order project planning, "project planning" also refers to the continuous process of incorporating new knowledge into the initial project plan
- **Pull planning**: Project planning that accounts for the unpredictable, ever-changing nature of the living order. Pull planners start at the desired end state of the project, working backwards to determine the most efficient (least wasteful) way to achieve the desired outcome. To be effective, pull planning requires a collaborative group of workers who coordinate regularly, updating their plan to reflect current conditions
- **Pull schedule**: A schedule typically consisting of color-coded sticky notes that can be removed or repositioned as necessary. This can also be replicated in a number of different software programs. The key is to start with the end goal and then work backwards to determine the tasks required to achieve that goal
- **Push planning**: Project planning that presumes events will unfold in a predictable, geometric order. Push planning is founded on management forecasts of customer demand, with great emphasis placed on the need to keep the parts of the plan moving forward. Managers and subcontractors focus on their individual portions of the project, with limited regard for managing workflow and preventing waste through collaboration and coordination
- **Supply chain management**: All the "activities that must take place to get the right product into the right consumer's hands in the right quantity and at the right time—from raw materials extraction to consumer purchase" (Mays Business School n.d.)
- **Waterfall model**: A push plan model used for software that breaks the development process into a set of discrete, sequential steps. It presumes a predictable project outcome, with little or no opportunity for adjustments as the project unfolds

Module 2: Project Scheduling

- **Activity:** “An element of work performed during the course of a project. An activity normally has an expected duration, an expected cost, and expected resource requirements” (Project-Management.com 2016). Beware that some organizations subdivide activities into tasks, while others use *task* and *activity* synonymously
- **Compress a schedule:** The process of taking a schedule you have already developed and reducing it without adjusting the project’s scope
- **Cost:** “An expenditure, usually of money, for the purchase of goods or services” (Law 2016)
- **Crashing:** A schedule compression technique that involves adding resources such as overtime or more equipment to speed up the schedule. Because of the costs involved in adding resources, crashing is “the technique to use when fast tracking has not saved *enough* time on the project schedule. With this technique, resources are added to the project for the least cost possible” (Monnappa 2017)
- **Critical path**: The “series of activities which determines the earliest completion of the project” (Project-Management.com 2016)
- **Duration:** “The time needed to complete an activity, path, or project” (Larson and Gray 2011, 659)
- **Fast tracking:** A schedule compression technique in which “activities that would have been performed sequentially using the original schedule are performed in parallel. In other words, fast tracking a project means the activities are worked on simultaneously instead of waiting for each piece to be completed separately. But fast tracking can only be applied if the activities in question can actually be overlapped” (Monnappa 2017)
- **Float:** See *slack*
- **Last Planner System (LPS):** A proprietary production planning system that exemplifies living order concepts and pull thinking; developed by Glenn Ballard and Greg Howell as a practical implementaion of Lean principles
- **Last responsible moment:** “The instant in which the cost of the delay of a decision surpasses the benefit of delay; or the moment when failing to make a decision eliminates an important alternative” (Lean Construction Institute)
- **Milestone:** “A significant event in the project; usually completion of a major deliverable” (State of Michigan: Department of Technology, Management & Budget)
- **Path: “**A sequence of connected activities” (Larson and Gray 2011, 662)
- **Reliable promise**: In Lean and the Last Planner System, a formal commitments between team members. As defined by the Lean Construction Institute, “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” (Lean Construction Institute n.d.)
- **resource:** “Any personnel, material, or equipment required for the performance of an activity” (Project-Management.com 2016)
- **Schedule**: A specific, time-based map designed to help the project team get from the current state to successful project completion. A schedule should build value, have an efficient flow, and be driven by pull forces

- **Slack**: "Calculated time span during which an event has to occur within the logical and imposed constraints of the network, without affecting the total project duration" (Project-Management.com 2016). Or put more simply, slack, which is also called *float,* is the "amount of time that a task can be delayed without causing a delay" to subsequent tasks or the project's ultimate completion date (Santiago and Magallon 2009)
- **Sprint**: In Agile project management, a brief (typically two-week) iterative cycle focused on producing an identified working deliverable (e.g., a segment of working code)
- **Task:** *See* activity

Module 3: Project Risk Management

- **Black swan event:** Term used by Nassim Nicholas Taleb in his book *Black Swan: The Impact of the Highly Improbable* to refer to the most extreme form of externality. According to Taleb, a black swan event has the following characteristics: it is an outlier, unlike anything that has happened in the past; it has an extreme impact; and, after it occurs, people are inclined to generate a rationale for it that makes it seem predictable after all (2010, xxii)
- **Contingency planning**: The development of alternative plans that can be deployed if certain risks are realized (e.g., parts from a supplier do not meet quality requirements)
- **Ethics**: According to Merriam-Webster, a "set of moral principles: a theory or system of moral values"
- **Integrated Project Delivery**: A Lean-oriented contractual arrangement that emphasizes collaboration among all participants from the very earliest stages of the project, and that encourages participants to help solve each other's problems, taking a proactive approach to risk (Thomack 2018)
- **Issue**: A known concern, something a team will definitely have to address. Compare to a risk, which is caused by external factors that the project team cannot fully identify
- **Monetize risk**: To assign a dollar value to the potential impact of risks facing a project. Monetizing risks gives outcomes "real economic value when the effects might otherwise be ignored" (Viscusi 2005). Once you've monetized a project's risks, you can rank them and make decisions about which deserves your most urgent attention. You can also evaluate the cost-effectiveness of steps required to reduce risk. Every industry has its own calculations for monetizing risks, although it is unethical in some industries, especially where public safety is concerned
- **Monte Carlo simulation**: "A mathematical technique that generates random variables for modelling risk or uncertainty of a certain system. The random variables or inputs are modeled on the basis of probability distributions such as normal, log normal, etc. Different iterations or simulations are run for generating paths and the outcome is arrived at by using suitable numerical computations" (The Economic Times n.d.)
- **Proactive concurrency**: Intentionally developing an awareness of options that can be employed in case you run into problems with your original plan
- **Risk**: The probability that something bad will happen times the consequences if it does. The likelihood of a risk being realized is typically represented as a probability value from 0 to 1, with 0 indicating that the risk does not exist, and 1 indicating that the risk is absolutely certain to occur

- **Risk management**: "The process of identifying, quantifying, and managing the risks that an organization faces" (Financial Times)
- **Risk matrix**: A risk management tool in which the probability of the risk is multiplied by the severity of consequences if the risk does indeed materialize
- **Tolerable risk**: The risk you are willing to live with in order to enjoy certain benefits
- **Threat**: A potential hazard that could affect a project. A threat is not, in itself, a risk. A risk is the *probability* that the threat will be realized, multiplied times the consequences
- **Value of a statistical life**: An "estimate of the amount of money the public is willing to spend to reduce risk enough to save one life" (Craven McGinty 2016)

Module 4: Managing Project Value, Budgets, and Costs

- **Bottom-up estimate**: **"**Detailed cost estimate for a project, computed by estimating the cost of every activity in a work breakdown structure, summing these estimates, and adding appropriate overheads" (Business Dictionary n.d.). A bottom-up estimator starts by dividing the project up into tasks, then estimates a cost for each task, and sums the total costs for all the project tasks
- **Budget**: The funds that have been allocated for a project
- **Contingency fund**: A financial reserve that is allocated for identified risks that are accepted and for which contingent or mitigating responses are developed. Contingency funds are also often available to pay for an agreed-upon scope change
- **Cost**: "An expenditure, usually of money, for the purchase of goods or services" (Law 2016). Note that, like all terms, the meaning of "cost" varies somewhat from industry to industry. For example, in product development, the term has three specific meanings: 1) cost to create the product or project; 2) cost to establish a manufacturing cell capable of producing the product; and 3) cost of the final good or service to the market
- **Direct costs**: "An expense that can be traced directly to (or identified with) a specific cost center or cost object such as a department, process, or product" (Business Dictionary n.d.). Examples of direct costs include labor, materials, and equipment. A direct cost changes proportionately as more work is accomplished
- **Direct project overhead costs**: Costs that are directly tied to specific resources in the organization that are being used in the project. Examples include the cost of lighting, heating, and cleaning the space where the project team works. Overhead does not vary with project work, so it is often considered a fixed cost
- **Estimate**: An assessment of the likely budget for a project. An estimate involves counting and costing and is based on ranges and probabilities. Throughout a project, managers and team members are asked to estimate remaining work, cost at completion, and required remaining time. An estimate is a forward projection, using what is known, to identify, as best as possible, the required effort, time, and/or cost for part or all of a project
- **General and Administrative (G&A) overhead costs**: The "indirect costs of running a business, such as IT support, accounting, and marketing" (Investing Answers n.d.)
- **Iterative estimating**: A combination of top-down and bottom-up estimating, which involves constant refinement of the original estimate by taking into account information typically used in a top-down estimate (such as past history of similar projects) and increasingly detailed information generated by bottom-up estimating

- **Parametric estimating**: A way to use experience from parts of other projects to come up with estimates for work packages that are similar to past work but not the same
- **Phase estimating**: A type of iterative estimating that is "used when the project is large or lengthy or is developing something new or untried for the organization. In phased estimates, the near-term work is estimated with a high level of accuracy ±5 – 15% whereas future work is estimated at a high level with ±35% accuracy" (Goodrich n.d.). As the project advances through major phases, the budget for subsequent phases is intentionally reviewed and refined in light of knowledge gained to date
- **Price**: **"**A value that will purchase a finite quantity, weight, or other measure of a good or service" (Business Dictionary)
- **Project Variation Request (PVR)**: *See* Scope Change Request
- **Scope Change Request**: A document that describes a proposed scope change, including its potential benefits and the consequences of not implementing the change. A Scope Change Request must be signed by all affected stakeholders prior to implementing a scope change. Also known as a Project Variation Request (PVR)
- **Scope creep**: Changes to a project's scope without any corresponding changes to the schedule or cost. The term is typically applied to changes that were unapproved or lacked sufficient knowledge about the project and potential assessment of risks and costs when they were approved. Simply put, scope creep is unmanaged change
- **Scope evolution**: An alteration to the project scope that occurs as the project participants learn more about the project. Scope evolution results in an official change in the project scope, and therefore to the project budget or schedule, as agreed to by all project participants. In other words, scope evolution is managed change
- **Target value**: The output stakeholders want the project to generate
- **Target-value design**: A design process that focuses on value as defined by the customer, with the project's overall design involving stakeholder engagement and collaboration
- **Top-down estimates**—Estimates that "usually are derived from someone who uses experience and or information to determine the project duration and total cost. However, these estimates are sometimes made by top managers who have very little knowledge of the component activities used to complete the project" (Larson and Gray, 134). A top-down estimator generates a total for the entire project and then divides up that total among the various project tasks
- **Value**: "The inherent worth of a product as judged by the customer and reflected in its selling price and market demand" (Lean Enterprise Institute 2014)

Module 5: Managing Limited Resources

- **Fixed resource**: A resource that "remains unchanged as output increases" (Reference n.d.)
- **Over-allocation**: A resource allocation error that occurs when more work is assigned to a resource than can be completed within a particular time period, given that resource's availability
- **Over-commitment**: A resource allocation error that occurs when a task takes longer than expected, tying up the resource longer than originally scheduled

- **Proactive resilience**: Taking timely action to prevent a crisis, often by introducing a change that upends the usual way of doing things at an organization (Laufer, et al. 2018, 56)
- **Resource allocation**: The "process of assigning and managing assets in a manner that supports an organization's strategic goals" (Rouse n.d.). On the project level, resource allocation still involves making choices that support the organization's strategic goals, but you also have to factor in your project's more specific goals
- **Resource capacity management**: The practice of "planning your workforce and building a skill inventory in exact proportion to the demand you foresee. It lets you optimize productivity and as a concept perfectly complements the Agile methodology" (Gupta 2017)
- **Resource leveling:** An approach to project scheduling that aims to avoid over-allocation of resources by setting start and end dates according to the "availability of internal and external resources" (ITtoolkit n.d.)
- **Resource management:** *See* resource allocation
- **Resource parsimony:** "Deploying the fewest resources necessary to achieve the desired results" (Gibbert, Hoegl and Välikangas 2007)
- **Resource smoothing: "**A scheduling calculation that involves utilizing float or increasing or decreasing the resources required for specific activities, such that any peaks and troughs of resource usage are smoothed out. This does not affect the overall duration" *(Association for Project Management n.d.)*
- **Triple bottom line (TBL):** Term introduced by John Elkington as a way to broaden corporate thinking about the cost of doing business to include social and environmental responsibilities. He argued that rather than focusing solely on profit and loss, organizations should pay attention to three separate bottom lines: profit, people, and the planet. "It aims to measure the financial, social and environmental performance of the corporation over a period of time. Only a company that produces a TBL is taking account of the full cost involved in doing business" (The Economist 2009)
- **Variable resource**: A resource that changes "in tandem with output" (Reference n.d.)