FOUNDATIONAL CONCEPTS

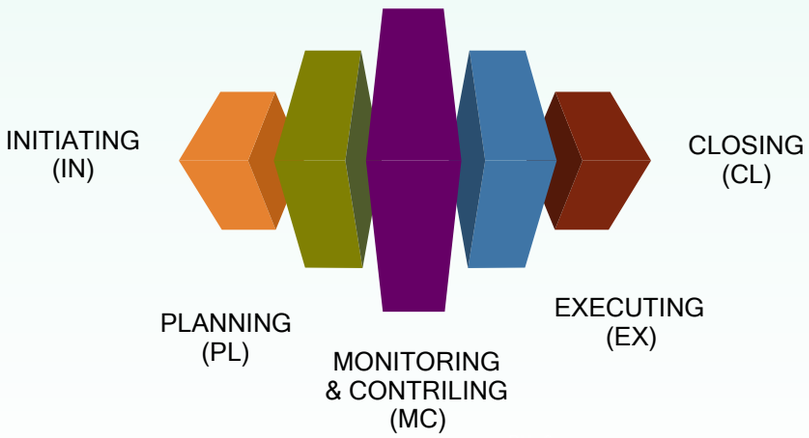
PROJECT LIFE CYCLE

- A project life cycle is the series of phases the project passes through from the initiation to its closure
- The life cycle provides the basic framework for managing the project
- The project life cycle can range from:
  - Predictive (plan-driven approaches): where the product and deliverable are defined at the beginning and any changes to scope are carefully managed. Also referred to as Waterfall life cycle
  - Adaptive (change-driven approaches or agile method): where the product is developed over multiple iterations and detailed scope is defined for each iteration only.
    - Iterative: the scope is determined at the beginning. However the **cost and time are routinely modified** as the team understands the product more.
    - Incremental: the deliverables is produced through series of iterations that successively add functionality within **predetermined timeframe**.
  - Hybrid: is a combination of predictive and adaptive life cycle.
- Cost and staffing levels are low at start and move higher towards the end
- Probability of successfully completing project is low at beginning, higher towards the end as the project continues
- Stakeholder influence is high at the beginning and progressively lowers as the project continues
- The project life cycle is independent from the life cycle of the product produced or modified by the project
- Project Life Cycle defines:
  - Technical work performed in each phase
  - Who is involved in each phase
- Product life cycle is different than the project life cycle where the product is produced by a project

Project Gate: An activity done at the end of a phase to compare the project progress against the work plan and project documents. Usually the outcome of this activity is to continue or not.

Development life cycle

- One or more phases are associated in the development of product or service it is the DLC
- The project manager and the project team identify the best life cycle for each project
- The development life cycle can utilize various models: Predictive, Iterative, Incremental, Adaptive, and Hybrid

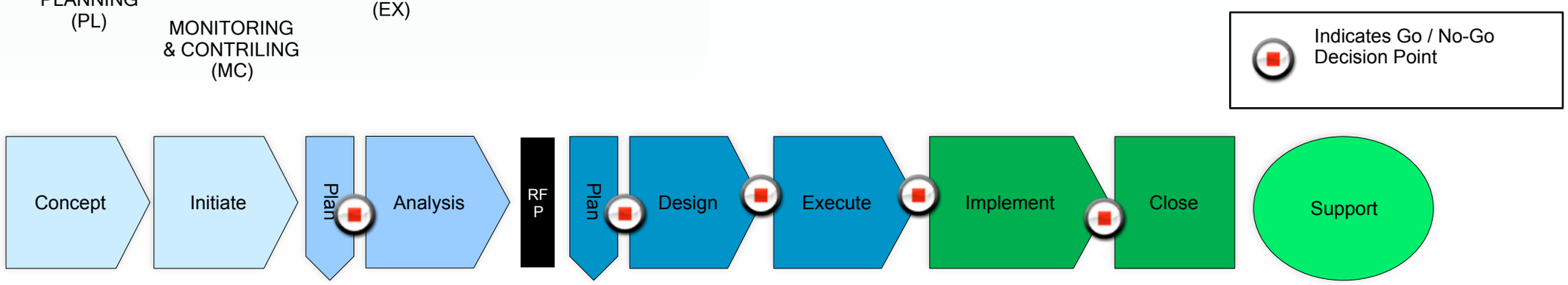


OPERATIONS MANAGEMENT

- Focuses on ongoing production and is outside the scope of the project management
- Operation management is responsible for overseeing, directing, and controlling business operations.
- Operations evolve to support day-to-day business, and are necessary to achieve strategic and tactical goals of the business.
- Ongoing operations are outside Of the scope of a project, however, there are intersecting points where the two areas across. Such as, but not limited to:
  - At each closeout phase
  - When developing a new product
  - While improving operations.
  - Until the end of product life cycle
- It is so important for PM to include operational stakeholders in all work and endeavors. As the operational stakeholders should be engaged and their needs identified as part of the stakeholders register, and their influence should be addressed as part of the risk management plan.

PROJECT PHASES

- The phases are generally sequential
- The phases can be broken down by functional or partial objectives
- Phases are generally time bounded with start and ending or control point
- Project Phases are marked by the completion of a deliverable (tangible, verifiable work product)
- Review of deliverables and approval/denial are “phase exits, stage gates, or kill points”
- Phases are collected into the Project Life Cycle
- Phase-to-Phase relationship:
  - Sequential relationship: Starts only when the previous phase is complete
  - Overlapping relationship: a phase starts before completion of the previous one
  - Overlapping is a “Schedule compression technique called Fast Tracking”
- Process groups are not the same as project phases
- Examples of project phase names: Design, prototype, build, test, lessons learned...etc.



A **project manage**r plays a critical role in the leadership of a project team in order to achieve the project's objectives. This role is clearly visible throughout the project. Many project managers become involved in a project from its initiation through closing. However, in some organizations, a project manager may be involved in evaluation and analysis activities prior to project initiation. These activities may include consulting with executive and business unit leaders on ideas for advancing strategic objectives, improving organizational performance, or meeting customer needs. In some organizational settings, the project manager may also be called upon to manage or assist in business analysis, business case development, and aspects of portfolio management for a project. A project manager may also be involved in follow-on activities related to realizing business benefits from the project. The role of a project manager may vary from organization to
organization. Ultimately, the project management role is tailored to fit the organization in the same way that the project management processes are tailored to fit the project.

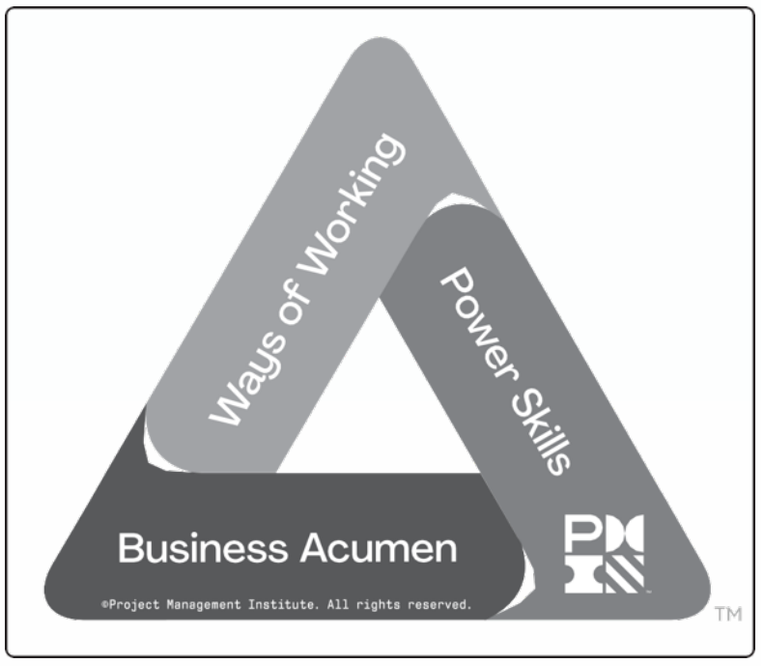
- **Project team and roles.** A large project comprises many members, each playing a different role. A large project may have more than 100 project members led by a project manager. Team members may fulfill many different roles, such as design, manufacturing, and facilities management. They may represent multiple business units or groups within an organization. The project members make up each leader's team.
- **Responsibility for team.** The project manager is responsible for what the team produces —the *project outcome*. The project manager needs to take a holistic view of the team's products in order to plan, coordinate, and complete them. This is accomplished by reviewing the vision, mission, and objectives of the organization to ensure alignment with their products. The project manager then establishes an interpretation of the vision, mission, and objectives involved in successfully completing their products, and uses this interpretation to communicate and motivate the team toward the successful completion of their objectives.
- **Knowledge and skills.** The project manager is not expected to perform every role on the project, but should possess project management knowledge, technical knowledge, understanding, and experience. The project manager provides the project team with leadership, planning, and coordination through communications. The project manager provides written communications (e.g., documented plans and schedules) and communicates in real time with the team using meetings and verbal or nonverbal cues.

Project Leadership Roles

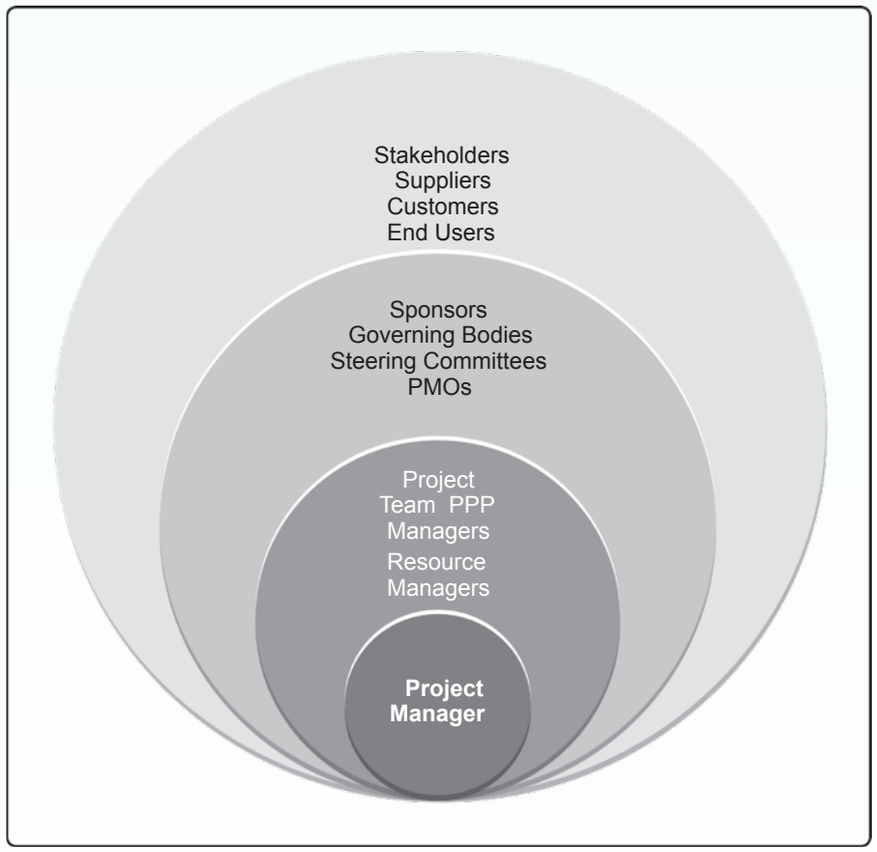
Project manager—The person assigned by the performing organization to lead the team that is responsible for achieving the project objectives.

Functional manager—The functional manager focuses on providing management oversight for a functional or business unit.

Operations manager—Operations managers are responsible for ensuring that business operations are efficient.



PROJECT ROLES



Example of Project Manager's Sphere of Influence

PROJECT MANAGER COMPETENCES

Recent PMI studies applied the *Project Manager Competency Development (PMCD) Framework* to the skills needed by project managers through the use of the PMI Talent Triangle® shown in the Figure. The Talent Triangle focuses on three key skill sets: Ways of Working, Business Acumen, and Power Skills.

WAYS OF WORKING

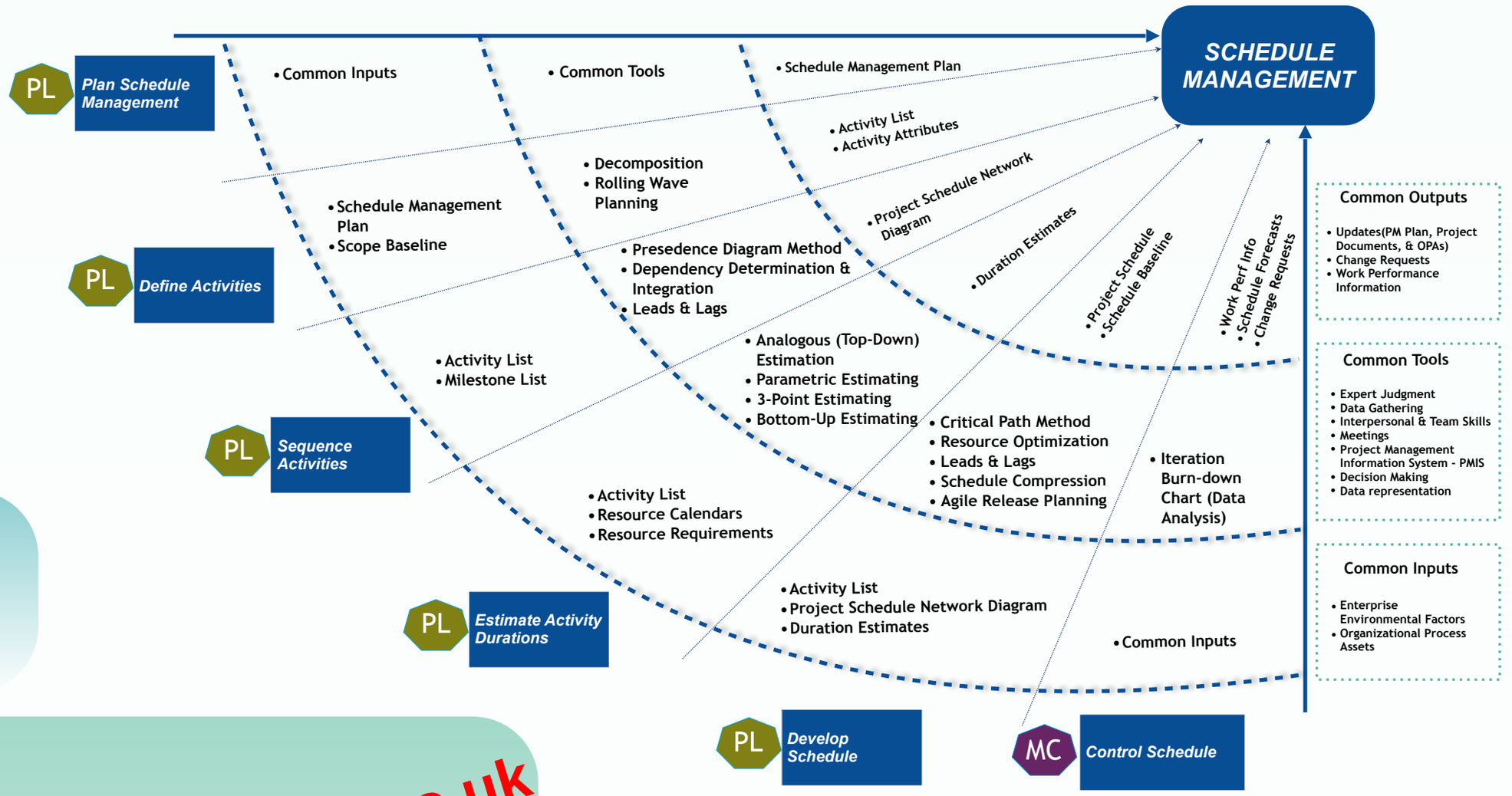
It is important for project managers to master diverse and creative ways of getting the job done. Project managers should understand and adopt many ways of working, including predictive, agile, design thinking, or other new practices still to be developed. This will allow individuals to quickly shift their way of working as new challenges arise. This enables success when the right solutions at the right moment in time are applied.

BUSINESS ACUMEN

Business acumen is the ability to make good judgments and quick decisions while understanding the many factors of influence across an organization or industry. Professionals at every level should actively develop business acumen, whether through experience, training, courses, certifications, or self-guided learning, to achieve the highest level of success. This enables a deeper knowledge of how any project aligns with the broader organizational strategy and global trends, enabling efficient and effective decision making.

POWER SKILLS

Beyond the traditional top-down leadership skills, power skills (formerly known as "soft skills") are the critical interpersonal skills of professionals at every level that enable them to apply influence, inspire change, and build relationships. Power skills include collaborative leadership skills, communication skills, having an innovative mindset, having a for-purpose orientation, and exercising empathy. Mastering these power skills allows professionals to be powerful, influential stakeholders who can instigate change and make ideas a reality.



NOTES ABOUT
SCHEDULE MANAGEMENT

AGILE ESTIMATING:

Relative Sizing: estimating the size of a story based on the size of another; e.g., ordering stories from most-difficult to least-difficult without estimating effort or duration
Wideband Delphi Estimating: estimating technique where team comes together for presentation of stories and discusses challenges, estimates in private. Story estimates are plotted on chart with no names, range of points is discussed; then another round of estimates; team attempts consensus
Planning Poker: team individually estimates effort to deliver story by writing the estimate on a card; each team member simultaneously • turns over card, and discussion is focused on high and low estimates for understanding. Team discusses and re-bears as needed until estimates are in line. Estimates may be in hours, a number of days, ideal days, affinity estimates, or points from the modified Fibonacci sequence
Fibonacci Sequence: sequence of numbers used in agile estimating; calculated by beginning with the series: 0,1, and adding the previous two numbers together to get the next number, often simplified/modified as 0,1,2,3,5,8,13,20,40,100
Affinity Estimating: rapidly estimate a large feature backlog-using shirt sizes, coffee cup sizes, or the Fibonacci sequence to place stories into similarly-sized groups
Ideal Time: amount of time an assignment would take with no interruptions or distractions. Some agile estimates use ideal time rather than actual time
Story Point: unit of measure to express the estimated difficulty (effort) of a story. Story points may be expressed in hours, days, as shirt sizes (XS, S, M, L, XL, XXL), or as a number of the Fibonacci sequence
Negative Float: the situation of a schedule activity's early finish (EF) being after a subsequent activity's early start (ES)
Critical Path Method (CPM): schedule analysis to determine the critical path, overall schedule, and each activity's float
Critical Chain Method (CCM): aggressive schedule management based on managing schedule buffers and keeping resources fully applied (Eliyahu Goldratt)
Schedule Compression: Crashing (adding resources & cost) or Fast Tracking (adjusting dependencies and increasing risk) to shorten the overall schedule

Resource Optimization: Smoothing or leveling - Adjusting resources to the level of resources available; balancing loading
Simulation: Monte Carlo analysis/simulation - compute large numbers of possible scenarios related to schedule; what are the highest risks?
What-If: Analyze the impact of events or scenarios; Is the current plan practical? What changes or reserves are appropriate? Milestone Schedule: a high-level schedule showing only significant schedule points
Gantt Chart (bar chart): a schedule using horizontal bars to represent activities; the bar length represents activity duration; placement represents start and finish dates
Project Schedule: when activities should take place, what order, what durations, milestones, what resources.
Schedule Baseline: a formal version of the project schedule that is placed under control; the schedule baseline is a component of the project plan
Iteration: cycle of work repeated on agile projects (planning session, period of work, and retrospective). Agile principle #3 states that iterations are from 2 weeks to 2 months; XP methodology condenses them to 1 week
Sprint: iteration on a Scrum project that lasts between 1 week and 1 month
Hardening Iteration: building in an iteration prior to a significant release where no new development, functionality, or value is planned; instead, team tests functionality and integration of developed features from previous iterations to ensure solid functionality
Iteration Backlog: work that is committed in an iteration; expected to “bum down" throughout the iteration (do not confuse with product backlog)
Velocity: the number of story points that a team delivers per iteration; a measure of productivity
Release: packaged group of stable deliverables designed to be delivered to customers
Release Plan: agile non-binding expectation of what future iteration increments will be combined into releases to the customer