

Project Management - Foundational Elements

Project / Program / Portfolio / Operations

- A **project** is “a temporary endeavor undertaken to create a unique product, service, or result”
- A **program** is “a group of related projects managed in a coordinated manner to obtain benefits and control not available from managing them individually”
- A **portfolio** is a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.
- Portfolio management focuses on doing the “right” programs and projects.
- Operations management is an area that is outside the scope of formal project management as described in PM BoK.
- Operations management is concerned with the ongoing production of goods and/or services. It ensures that business operations continue efficiently by using the optimal resources needed to meet customer demands. It is concerned with managing processes that transform inputs (e.g., materials, components, energy, and labor) into outputs (e.g., products, goods, and/or services).

~ (PMBOK® Guide, Sixth Edition, 2017)



Organizational Project Management

- OPM is defined as a framework in which portfolio, program, and project management are integrated with organizational enablers in order to achieve strategic objectives.
- The purpose of OPM is to ensure that the organization undertakes the right projects and allocates critical resources appropriately.
- OPM also helps to ensure that all levels in the organization understand the strategic vision, the initiatives that support the vision, the objectives, and the deliverables

Operations Management

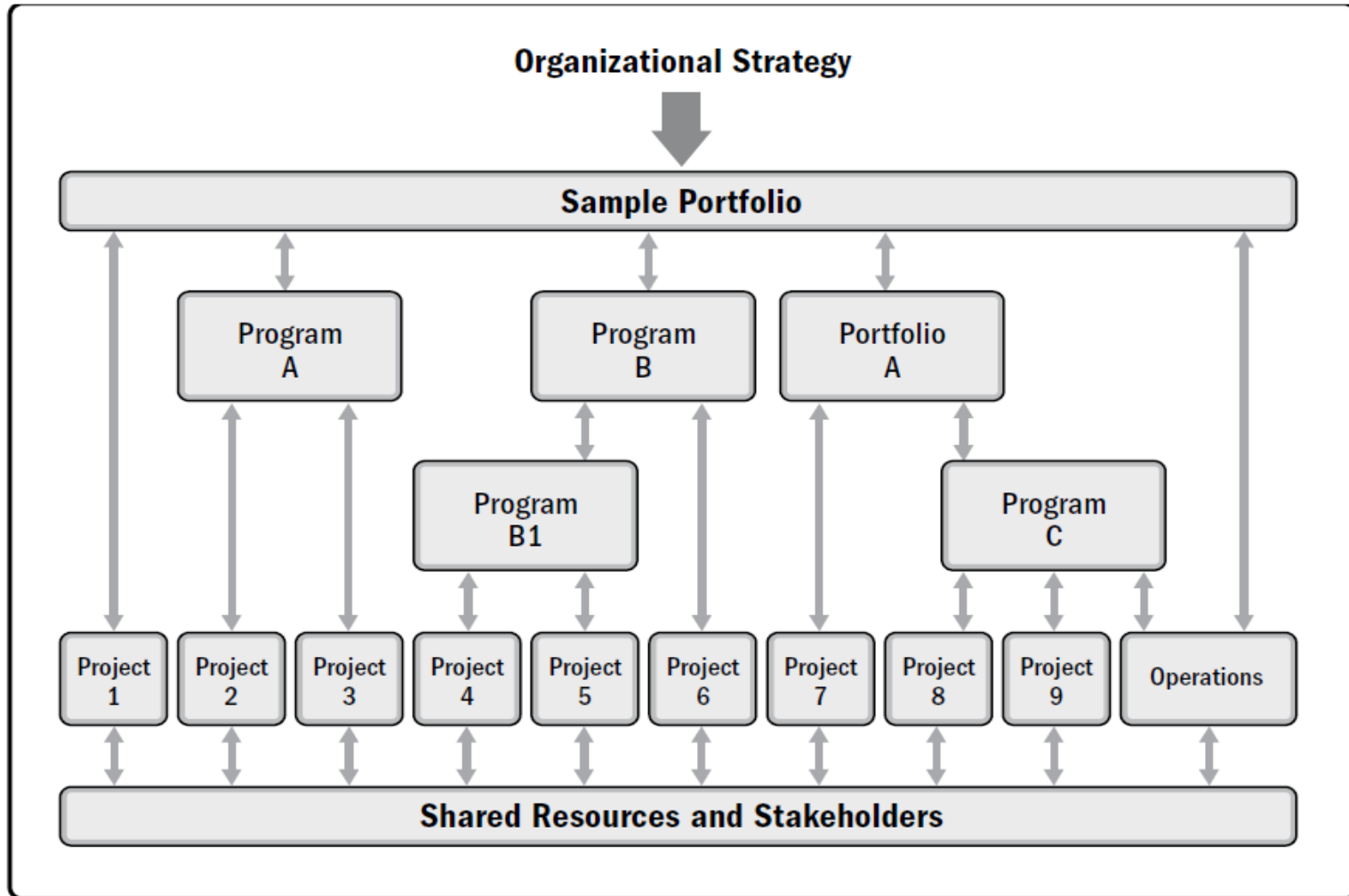
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Operations management is **concerned with the ongoing production of goods and/or services.**

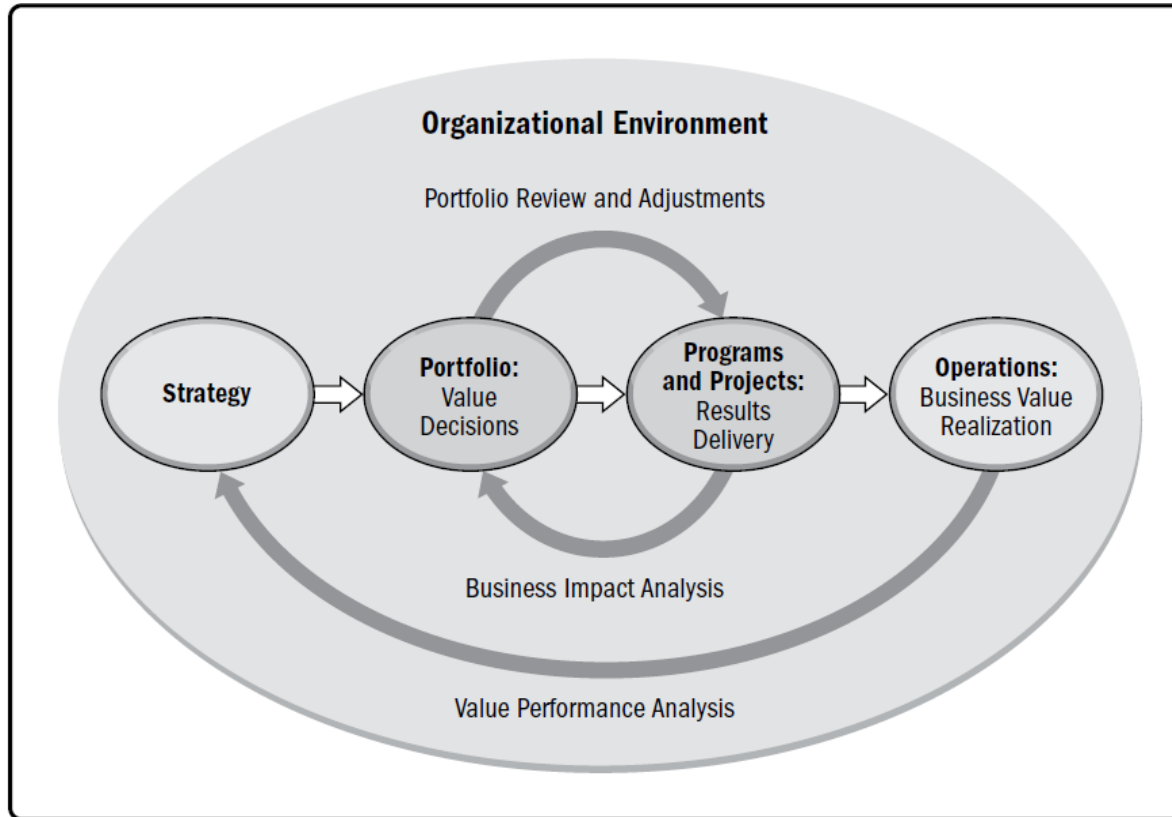
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Project / Program / Portfolio / Operations

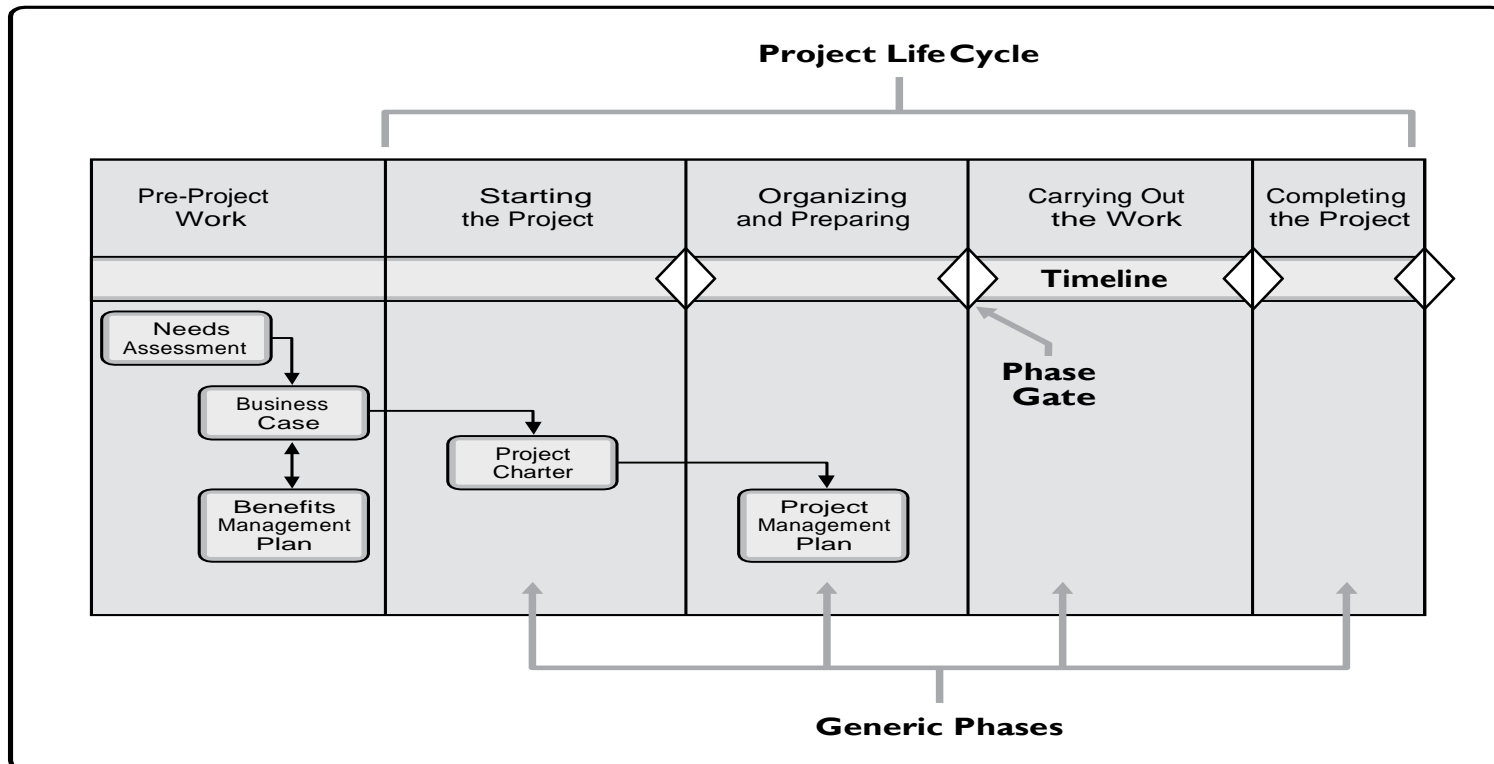


Project / Program / Portfolio / Operations



Project Life Cycle

- A project life cycle is the series of phases that a project passes through from its start to its completion. It provides the basic framework for managing the project.
- The phases may be *sequential, iterative, or overlapping*. All projects can be mapped to the generic life cycle
- Project life cycles can be *predictive or adaptive*.



Development Life Cycle

- Within a project life cycle, there are generally one or more phases that are associated with the development of the product, service, or result. These are called a development life cycle.
- In a **predictive life cycle**, the project scope, time, and cost are determined in the early phases of the life cycle. Any changes to the scope are carefully managed. Predictive life cycles may also be referred to as **waterfall life cycles**.
- In an **iterative life cycle**, the project scope is generally determined early in the project life cycle, but time and cost estimates are routinely modified as the project team's understanding of the product increases. Iterations develop the product through a series of repeated cycles, while increments successively add to the functionality of the product.
- In an **incremental life cycle**, the deliverable is produced through a series of iterations that successively add functionality within a predetermined time frame. The deliverable contains the necessary and sufficient capability to be considered complete only after the final iteration.
- **Adaptive life cycles** are agile, iterative, or incremental. The detailed scope is defined and approved before the start of an iteration. Adaptive life cycles are also referred to as agile or change-driven life cycles.
- A **hybrid life cycle** is a combination of a predictive and an adaptive life cycle. Those elements of the project that are well known or have fixed requirements follow a predictive development life cycle, and those elements that are still evolving follow an adaptive development life cycle.

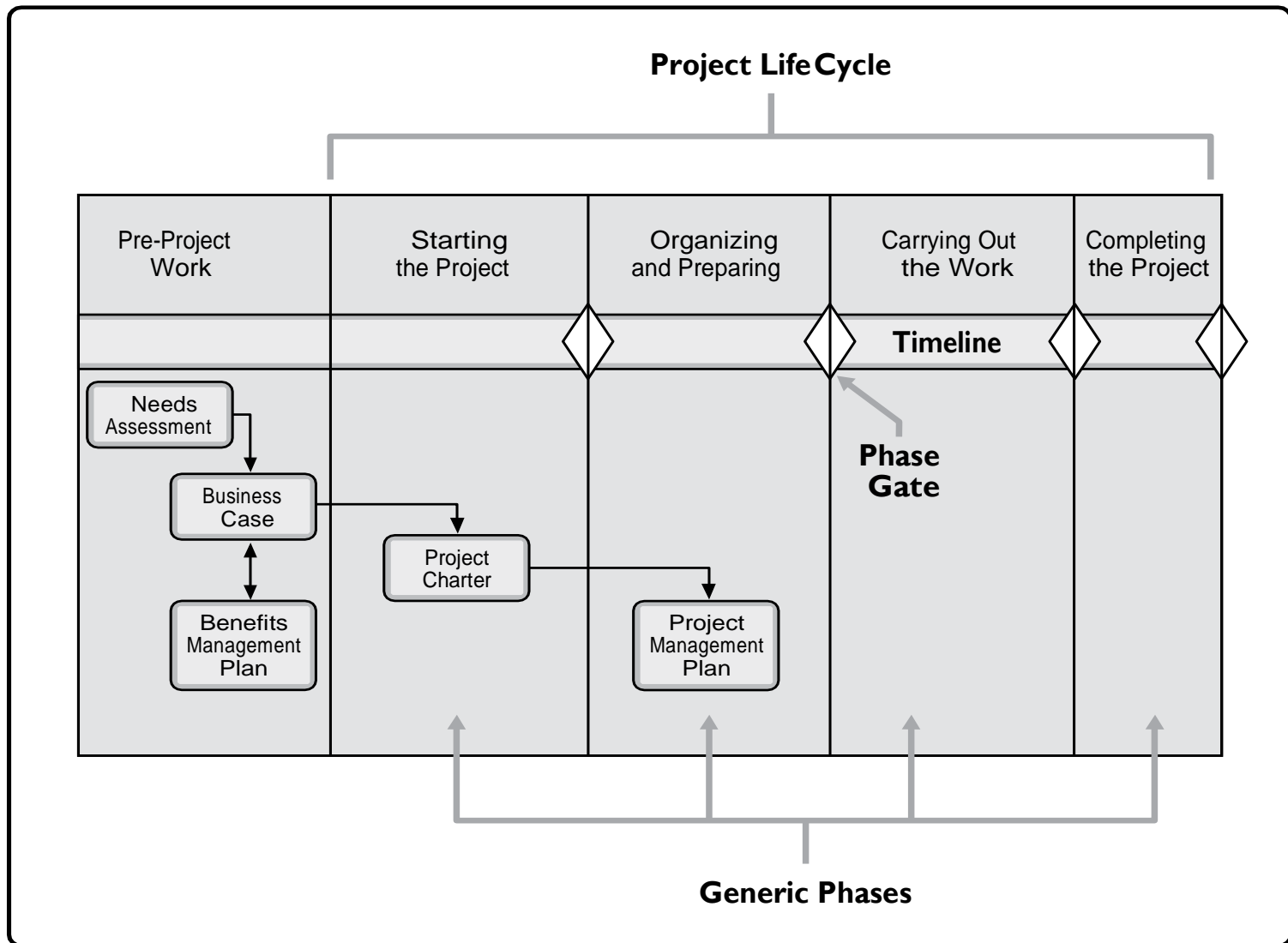
Project Phase

- A project phase is a collection of logically related project activities that culminates in the completion of one or more deliverables.
- The phases in a life cycle can be described by a variety of attributes. Attributes may be measurable and unique to a specific phase. Attributes may include but are not limited to:
 - Name (e.g., Phase A, Phase B, Phase 1, Phase 2, proposal phase),
 - Number (e.g., three phases in the project, five phases in the project),
 - Duration (e.g., 1 week, 1 month, 1 quarter),
 - Resource requirements (e.g., people, buildings, equipment),
 - Entrance criteria for a project to move into that phase (e.g., specified approvals documented, specified documents completed), and
 - Exit criteria for a project to complete a phase (e.g., documented approvals, completed documents, completed deliverables).

Project Phase

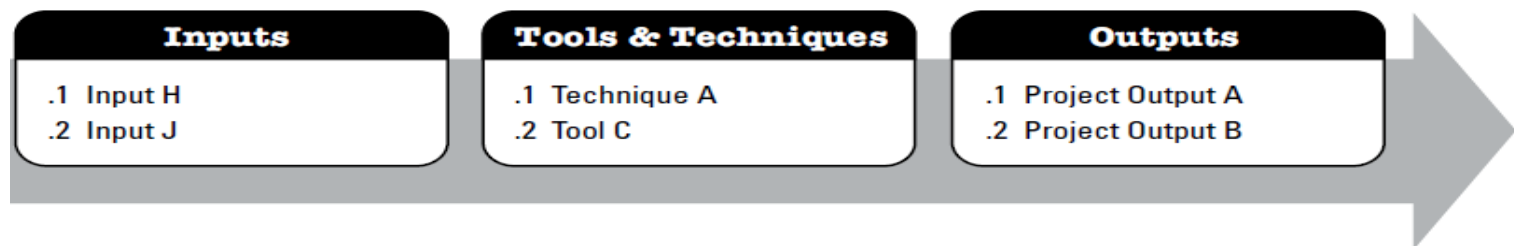
- Projects may be separated into distinct phases or subcomponents. These phases or subcomponents are generally given names that indicate the type of work done in that phase.
- Examples of phase names include but are not limited to:
 - Concept development,
 - Feasibility study,
 - Customer requirements,
 - Solution development,
 - Design,
 - Prototype,
 - Build,
 - Test,
 - Transition,
 - Commissioning,
 - Milestone review, and
 - Lessons learned.

Project Life Cycle



Project Management Processes

- The project life cycle is managed by executing a series of project management activities known as **project management processes**.
- **Project management process produces one or more outputs from one or more inputs by using appropriate project management tools and techniques.**
- Project management is accomplished through the appropriate application and integration of logically grouped project management processes.
- While there are different ways of grouping processes, the PMBOK® Guide groups processes into five categories called Process Groups.



Project Management Process groups

- A Project Management Process Group is a logical grouping of project management processes to achieve specific project objectives. **Process Groups are independent of project phases.**
 - Project management processes are grouped into five Project Management Process Groups
1. **Initiating Process Group:** Those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.
 2. **Planning Process Group:** Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.
 3. **Executing Process Group:** Those processes performed to complete the work defined in the project management plan to satisfy the project requirements.
 4. **Monitoring and Controlling Process Group:** Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
 5. **Closing Process Group:** Those processes performed to formally complete or close the project, phase, or contract

Project Management Knowledge Areas

- A **Knowledge Area** is an identified area of project management defined by its knowledge requirements and **described in terms of its component processes, practices, inputs, outputs, tools, and techniques.**
- Project managers must have knowledge and skills in all 10 knowledge areas:
 1. **Scope,**
 2. **Schedule,**
 3. **Cost,**
 4. **Quality,**
 5. **Resource,**
 6. **Communications,**
 7. **Risk,**
 8. **Procurement,**
 9. **Stakeholder, and**
 10. **Project integration management**

Project Management Knowledge Areas

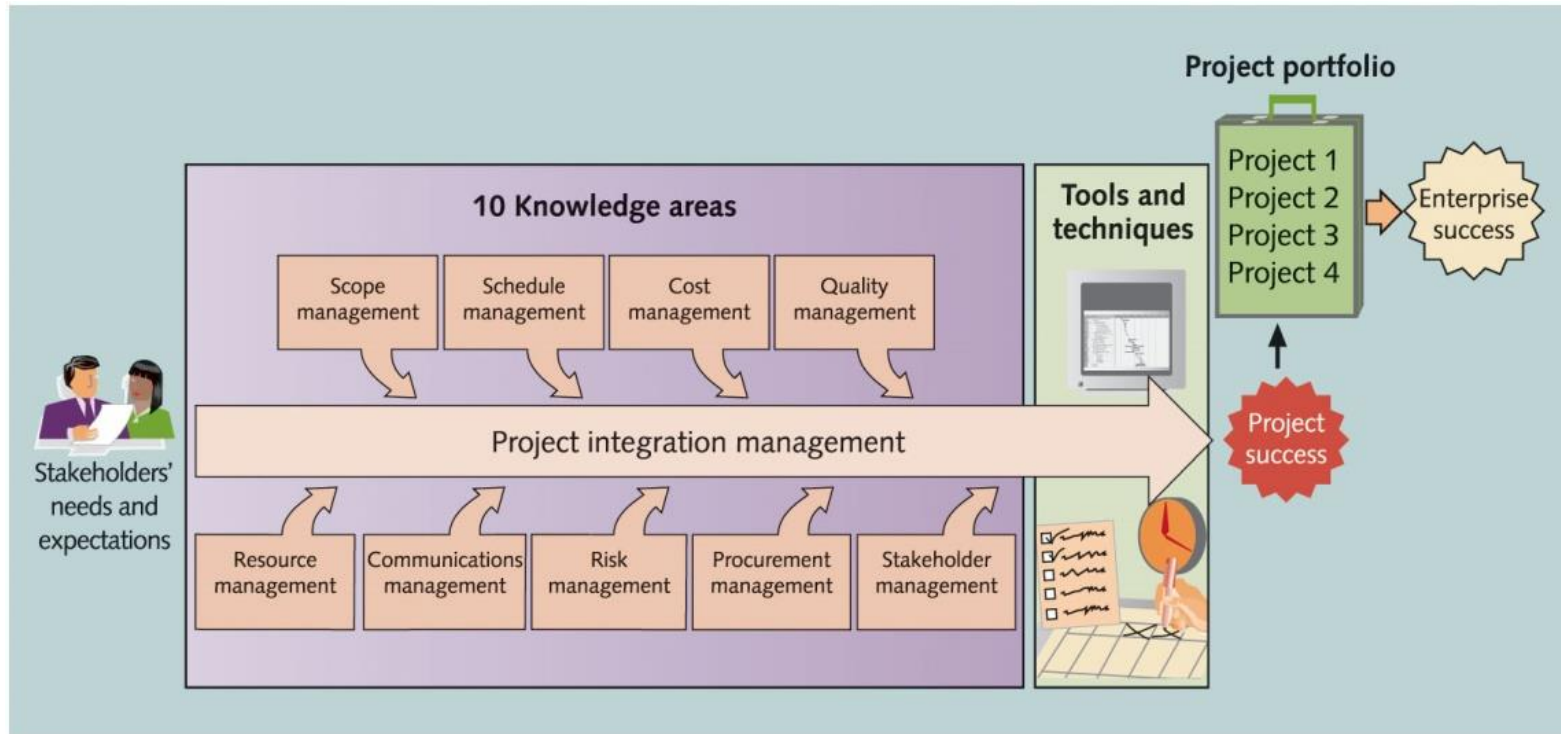
1. **Project Integration Management:** Includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups.
2. **Project Scope Management:** Includes the processes required to ensure *the project includes all the work required, and only the work required, to complete the project successfully.*
3. **Project Schedule Management:** Includes the processes required to *manage the timely completion of the project.*
4. **Project Cost Management:** Includes the processes involved *in planning, estimating, budgeting, financing, funding, managing, and controlling costs so the project can be completed within the approved budget.*
5. **Project Quality Management:** Includes the processes for incorporating the *organization's quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders' expectations.*
6. **Project Resource Management:** Includes the processes to *identify, acquire, and manage the resources, information needed for the successful completion of the project.*

Project Management Knowledge Areas

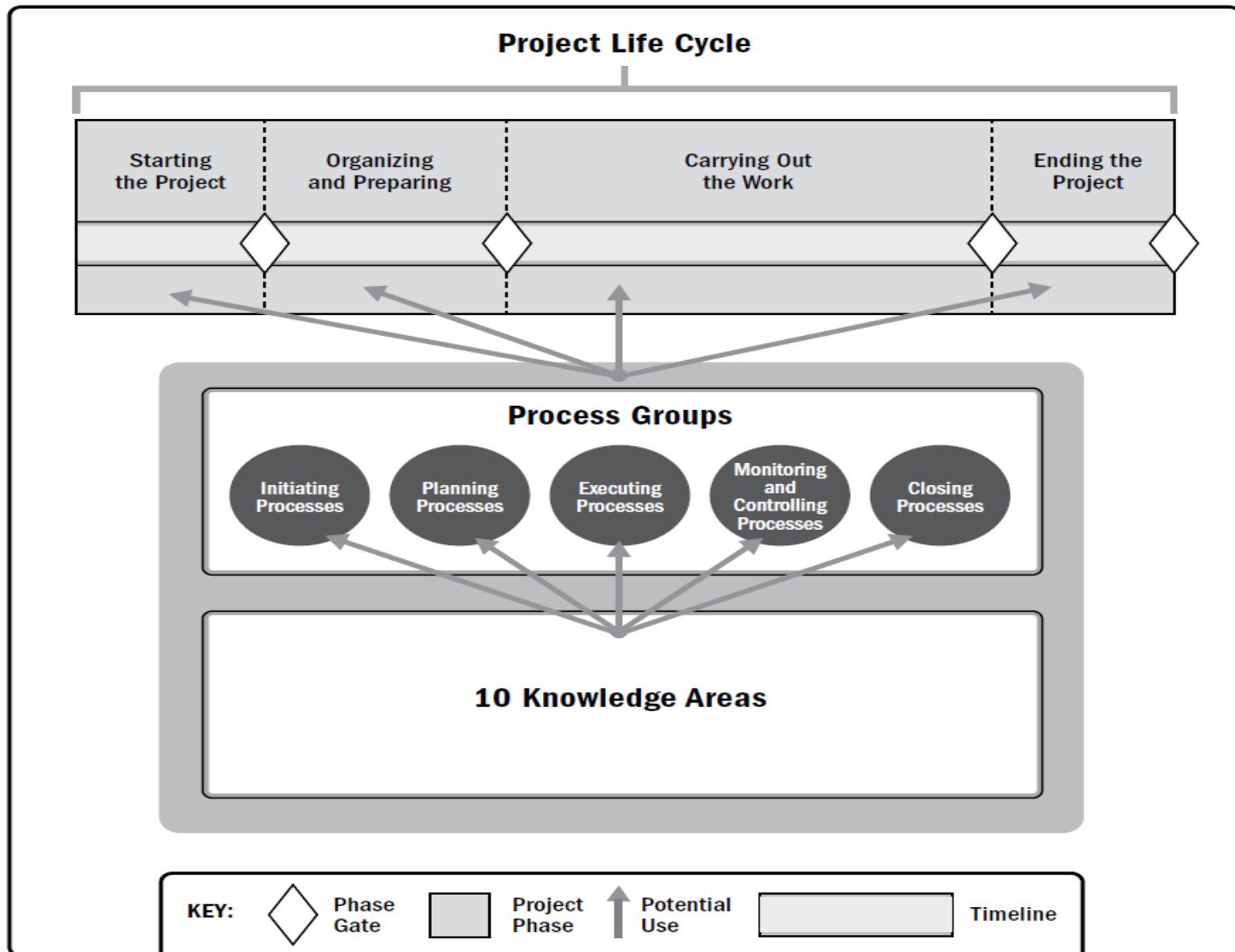
7. **Project Communications Management:** Includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project
8. **Project Risk Management:** Includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.
9. **Project Procurement Management:** Includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.
10. **Project Stakeholder Management:** Includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

The needs of a specific project may require one or more additional Knowledge Areas, for example, construction may require **financial management or safety and health management.**

Project Management framework



Interrelationship of PMBOK® Guide: Key Components in Projects



Project Management Tools & Techniques

- Project management tools and techniques assist project managers and their teams in various aspects of project management.
- Some specific ones include
 - Project charter, scope statement, and WBS (scope)
 - Gantt charts, network diagrams, critical path analysis
 - Cost estimates and earned value management (cost)

Project Management Process Group and Knowledge Area Mapping

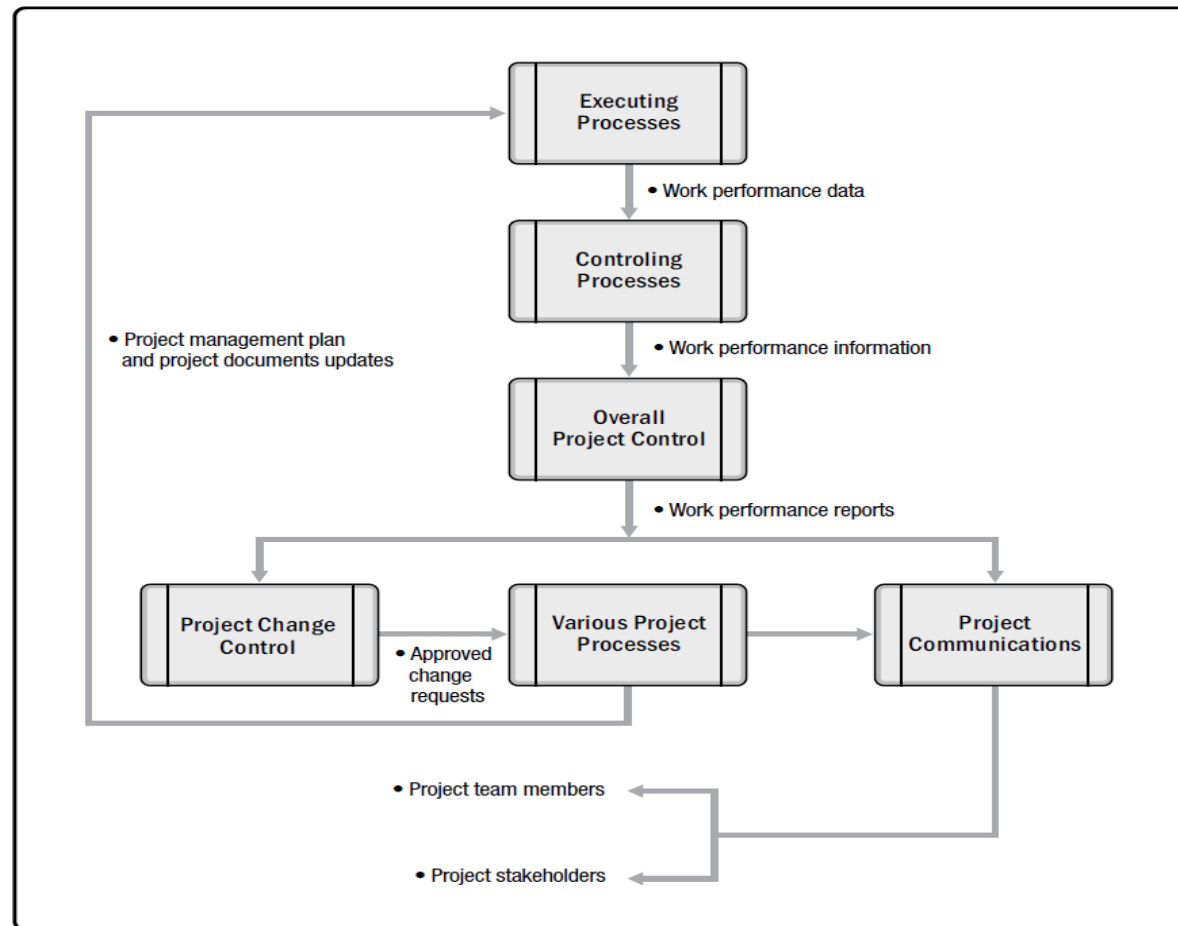
Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

Project Management Tools & Techniques

- PMBOK® Guide – Sixth Edition lists tools and techniques based on their purpose:
 - Data gathering
 - Data analysis
 - Data representation
 - Decision making
 - Communication
 - Interpersonal and team skills

Project Management Tools & Techniques

Throughout the life cycle of a project, a significant amount of data is collected, analyzed, and transformed. Project data are collected as a result of various processes and are shared within the project team



Tailoring

- Project managers apply a project management methodology to their work. A methodology is a system of practices, techniques, procedures, and rules used by those who work in a discipline
- Project management methodologies may be:
 - Developed by experts within the organization,
 - Purchased from vendors,
 - Obtained from professional associations, or
 - Acquired from government agencies.
- Tailoring is necessary because each project is unique; not every process, tool, technique, input, or output identified in the *PMBOK® Guide* is required on every project.
- The appropriate project management processes, inputs, tools, techniques, outputs, and life cycle phases should be selected to manage a project. This selection activity is known as tailoring project management to the project. The project manager collaborates with the project team, sponsor, organizational management, or some combination thereof, in the tailoring

Project Management Business Documents

- The project manager needs to ensure that the project management approach captures the intent of business documents.
- A needs assessment often precedes the business case. The needs assessment involves understanding business goals and objectives, issues, and opportunities and recommending proposals to address them

Project Business Documents	Definition
Project business case	A documented economic feasibility study used to establish the validity of the benefits of a selected component lacking sufficient definition and that is used as a basis for the authorization of further project management activities.
Project benefits management plan	The documented explanation defining the processes for creating, maximizing, and sustaining the benefits provided by a project.

- These two documents are interdependent and iteratively developed and maintained throughout the life cycle of the project.
- The project business case is a documented economic feasibility study used to establish the validity of the benefits.
- The business case lists the objectives and reasons for project initiation. It helps measure the project success at the end of the project against the project objectives.
- The business case may be used before the project initiation and may result in a go/no-go decision for the project.

Project Benefits Management Plan

- The project benefits management plan is the document that describes how and when the benefits of the project will be delivered, and describes the mechanisms that should be in place to measure those benefits.
- A project benefit is defined as an outcome of actions, behaviors, products, services, or results that provide value to the sponsoring organization as well as to the project's intended beneficiaries.
- **Target benefits** (e.g., the expected tangible and intangible value to be gained by the implementation of the project; financial value is expressed as net present value);
- **Strategic alignment** (e.g., how well the project benefits align to the business strategies of the organization);
- **Timeframe for realizing benefits** (e.g., benefits by phase, short-term, long-term, and ongoing);
- **Benefits owner** (e.g., the accountable person to monitor, record, and report realized benefits throughout the timeframe established in the plan);
- **Metrics** (e.g., the measures to be used to show benefits realized, direct measures, and indirect measures);
- **Assumptions** (e.g., factors expected to be in place or to be in evidence); and
- **Risks** (e.g., risks for realization of benefits).

Project Charter

- The **project charter** is defined as a document issued by the project sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.
- The project management plan is defined as the document that describes how the project will be executed, monitored, and controlled.

Project Success measures

- The project benefits management plan is the document that describes how and when the benefits of the project will be delivered, and describes the mechanisms that should be in place to measure those benefits.

Meeting business case nonfinancial objectives;

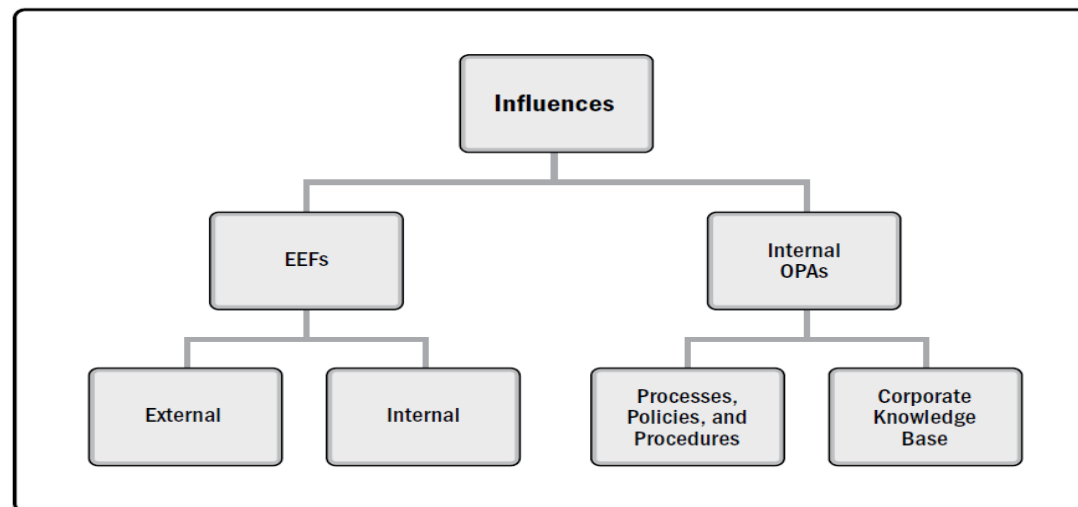
- Completing movement of an organization from its current state to the desired future state;
- Fulfilling contract terms and conditions; Meeting organizational strategy, goals, and objectives;
- Achieving stakeholder satisfaction; Acceptable customer/end-user adoption;
- Integration of deliverables into the organization's operating environment;
- Achieving agreed-upon quality of delivery; Meeting governance criteria; and
- Achieving other agreed-upon success measures or criteria (e.g., process throughput).

Meeting the agreed-upon financial measures documented in the business case.

- Net present value (NPV),
- Return on investment (ROI),
- Internal rate of return (IRR),
- Payback period (PBP), and
- Benefit-cost ratio (BCR).

Project Benefits Management Plan

- Projects exist and operate in environments that may have an influence on them. These influences can have a favorable or unfavorable impact on the project. Two major categories of influences are enterprise environmental factors (EEFs) and organizational process assets (OPAs).
- EEFs originate from the environment outside of the project and often outside of the enterprise
- OPAs are internal to the organization. These may arise from the organization itself, a portfolio, a program, another project, or a combination of these



EEF external

- **Marketplace conditions.** Examples include competitors, market share brand recognition, and trademarks.
- **Social and cultural influences and issues.** Examples include political climate, codes of conduct, ethics, and perceptions.
- **Legal restrictions.** Examples include country or local laws and regulations related to security, data protection, business conduct, employment, and procurement.
- **Commercial databases.** Examples include benchmarking results, standardized cost estimating data, industry risk study information, and risk databases.
- **Academic research.** Examples include industry studies, publications, and benchmarking results.
- **Government or industry standards.** Examples include regulatory agency regulations and standards related to products, production, environment, quality, and workmanship.
- **Financial considerations.** Examples include currency exchange rates, interest rates, inflation rates, tariffs, and geographic location.
- **Physical environmental elements.** Examples include working conditions, weather, and constraints

EEF's - internal

- **Organizational culture, structure, and governance.** Examples include vision, mission, values, beliefs, cultural norms, leadership style, hierarchy and authority relationships, organizational style, ethics, and code of conduct.
- **Geographic distribution of facilities and resources.** Examples include factory locations, virtual teams, shared systems, and cloud computing.
- **Infrastructure.** Examples include existing facilities, equipment, organizational telecommunications channels, information technology hardware, availability, and capacity.
- **Information technology software.** Examples include scheduling software tools, configuration management systems, web interfaces to other online automated systems, and work authorization systems.
- **Resource availability.** Examples include contracting and purchasing constraints, approved providers and subcontractors, and collaboration agreements.
- **Employee capability.** Examples include existing human resources expertise, skills, competencies, and specialized knowledge.

Project Management Standards

Standards for Project Management

- The Standard for Project Management provides a basis for understanding project management and how it enables intended outcomes.
- This standard applies regardless of industry, location, size, or delivery approach, for example, predictive, hybrid, or adaptive.
- Project management needs to be tailored to fit the needs of the project, the standard and the guide are both based on *descriptive* practices, rather than *prescriptive* practices.
- Therefore, the standard identifies the processes that are considered good practices on most projects, most of the time.
- The standard also identifies the inputs and outputs that are usually associated with the PM processes.

Audience for PM Standards

This standard provides a foundational reference for stakeholders participating in a project, and includes project practitioners, consultants, educators, students, sponsors, stakeholders, and vendors who:

- Are responsible or accountable for delivering project outcomes;
- Work on projects full or part time;
- Work in portfolio, program, or project management offices (PMOs);
- Are involved in project sponsorship, product ownership, product management, executive leadership, or project governance;
- Are involved with portfolio or program management;
- Provide resources for project work;
- Focus on value delivery for portfolios, programs, and projects;
- Teach or study project management; and
- Are involved in any aspect of the project value delivery chain.

Ethics in Project Management

- Ethics, loosely defined, is a set of principles that guide our decision making based on personal values of what is “right” and “wrong”
- Project managers often face ethical dilemmas
- In order to earn PMP® certification, applicants must agree to PMI’s Code of Ethics and Professional Conduct
- Several questions on the PMP® exam are related to professional responsibility, including ethics.

PMI – Code of Ethics

- The Code of Ethics and Professional Conduct includes both aspirational standards and mandatory standards.
- The aspirational standards describe the conduct that practitioners, who are also PMI members, certification holders, or volunteers, strive to uphold.
- Although adherence to the aspirational standards is not easily measured, conduct in accordance with these is an expectation for those who consider themselves to be professionals—it is not optional.
- The mandatory standards establish firm requirements and, in some cases, limit or prohibit practitioner behavior. Practitioners who are also PMI members, certification holders, or volunteers and who do not conduct themselves in accordance with these standards will be subject to disciplinary procedures before PMI's Ethics Review Committee.



PMI – Code of Ethics and Professional Conduct

The PMI Code of Ethics and Professional Conduct is based on **four values** that were identified as most important to the project management community:

1. **Responsibility**: Responsibility is our duty to take ownership for the decisions we make or fail to make, the actions we take or fail to take, and the consequences that result.
2. **Respect** : Respect is our duty to show a high regard for ourselves, others, and the resources entrusted to us. Resources entrusted to us may include people, money, reputation, the safety of others, and natural or environmental resources. An environment of respect engenders trust, confidence, and performance excellence by fostering mutual cooperation—an environment where diverse perspectives and views are encouraged and valued.
3. **Fairness** : Fairness is our duty to make decisions and act impartially and objectively. Our conduct must be free from competing self interest, prejudice, and favoritism
4. **Honesty** : Honesty is our duty to understand the truth and act in a truthful manner both in our communications and in our conduct.)

Thank You