

Addis College
Construction project management

Construction Project Management body of knowledge

June 2019

Construction Project Management body of knowledge

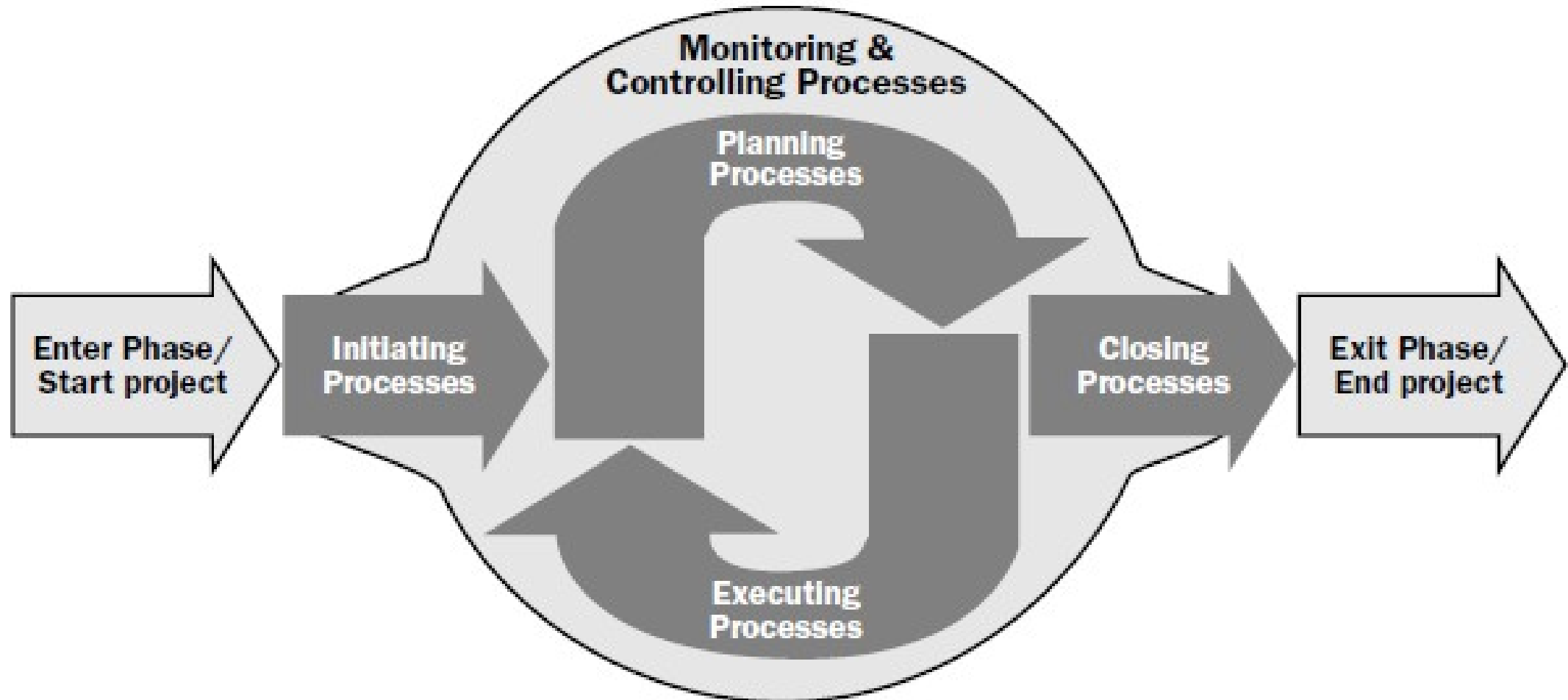
- + Project process management
- + Project scope management
- + Project quality management
- + Project stake holder management
- + Project communication management
- + Change, uncertainty and risk management

4. Project Process Management

- Project management is the **application of knowledge, skills, tools, and techniques** to project activities to meet the project requirements.
- This application of knowledge **requires the effective management of the project processes.**
- **A process** is a set of interrelated actions and activities performed to create a pre-specified product, service, or result.
- Each process is characterized by its **inputs, the tools and techniques** that can be applied, and the resulting **outputs.**

4. Project Process Management

- **Project Management Process Groups**



4. Project Process Management

• Project Life Cycle

- A project life cycle is **the series of phases** that a project passes through **from its initiation to its closure**.
- The phases are generally **sequential**, and their names and numbers are determined by the management, the nature of the project itself, and its area of application.
- Phases are generally **time bounded, with a start and ending** or control point.

4. Project Process Management

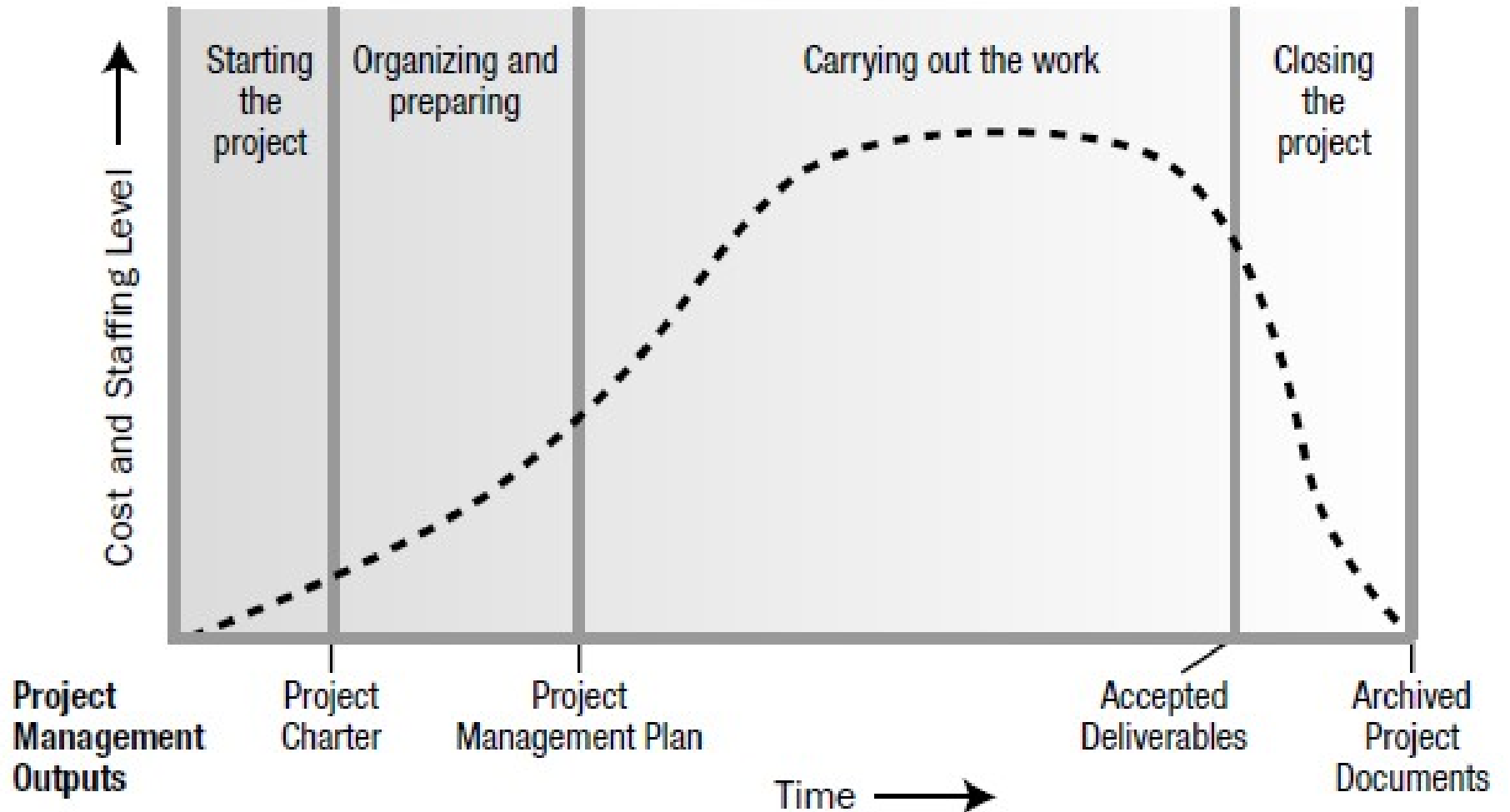
• **Project Life Cycle...**

- The project life cycle **can be determined or shaped** by the unique aspects of the organization, industry, or technology employed.
- The life cycle **provides the basic framework for managing the project**, regardless of the specific work involved.

4. Project Process Management

• Project Life Cycle...

Generic Project Life Cycle Structure



4. Project Process Management...

- Some literatures presented project life cycle into four to five phases with nearly similar functions

Item s	Project Management Processes	Authors
1	Identify a need, Develop a proposed Solution, Perform the Project, and Terminate the project	Gido & Clements, 1999
2	Initiating, Planning, Executing, Controlling, and Closing	PMIBoK, 2000
3	Feasibility or Conceptual, Definition, Execution and Close out	Laufer, 1995
4	Conceptualization, Planning, Execution and Termination	Meredith & Mantel, 2000
5	Early or Front - End Assessment, Implementation	Knut Samset, 2001
6	Concept (Conceive), Planning (Design, Plan and Allocate),	Chapman & Ward,

4. Project Process Management...

• **Construction Management Process System**

- **The construction process is defined as all processes which guides towards the planned construction works.**
- This means that the construction process as a concept covers **sub processes** having different characteristics.
- These sub processes can be grouped under three major classifications: ***Core processes, Administrative processes*** and ***Public regulatory processes***. These processes are termed **Project Processes**.

4. Project Process Management...

Relationship between the three main project processes and the four phases of the project cycle.

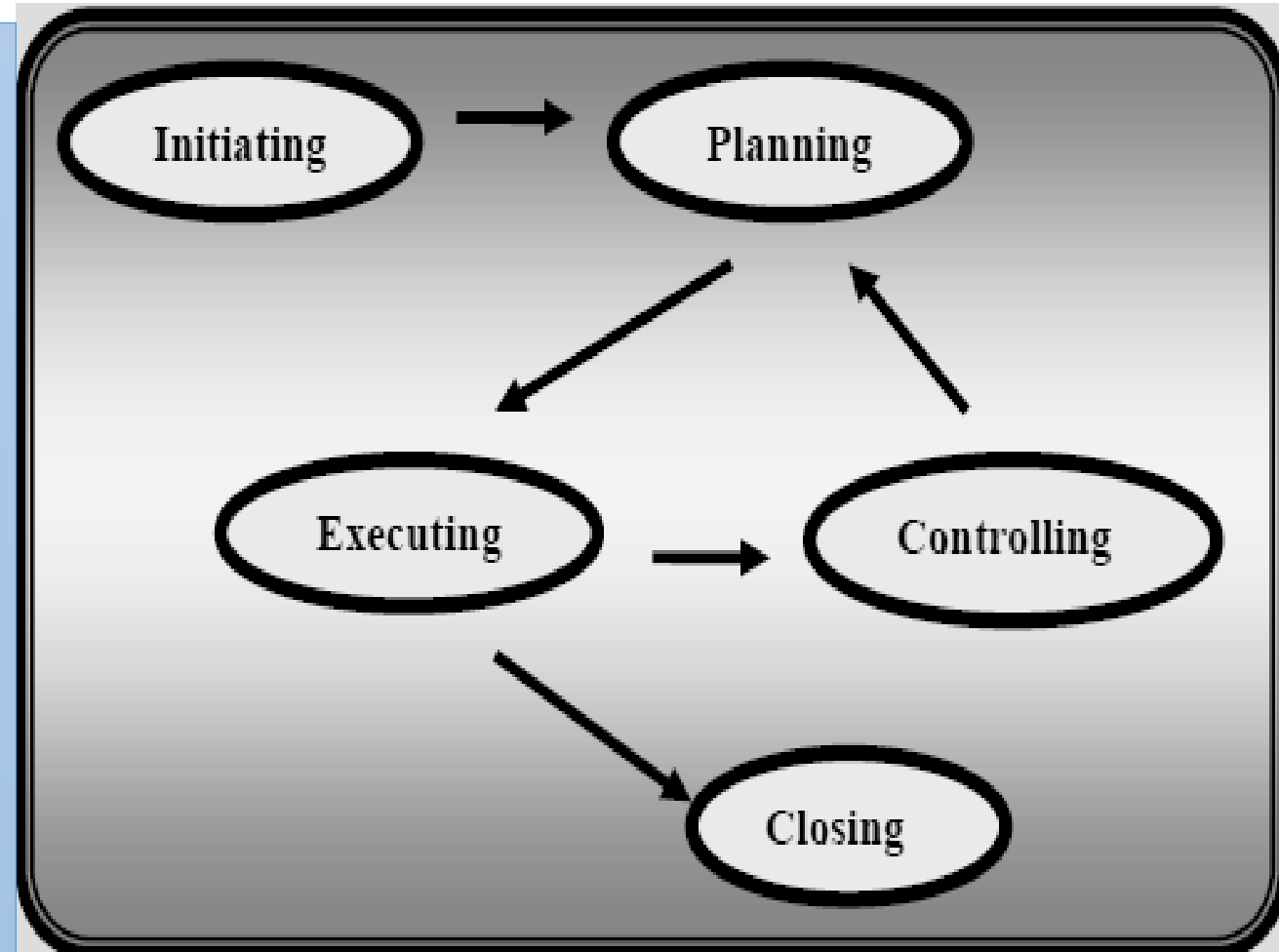


Core Processes	Concept Definition	Concept Development	Design of buildings, Roads, etc & Physical construction works	Maintenance Period and Defect Remedies
Administrative Processes	Concept Evaluation Project Approval Budget Allocation		Monitoring, Procurement and Other Processes	Acceptance, Hand Over and
Public Regulatory Processes	Right-of-way (if necessary) and Regulatory Permits		Tender award and Changes and Variation	Final Approval, and User Permit

4. Project Process Management...

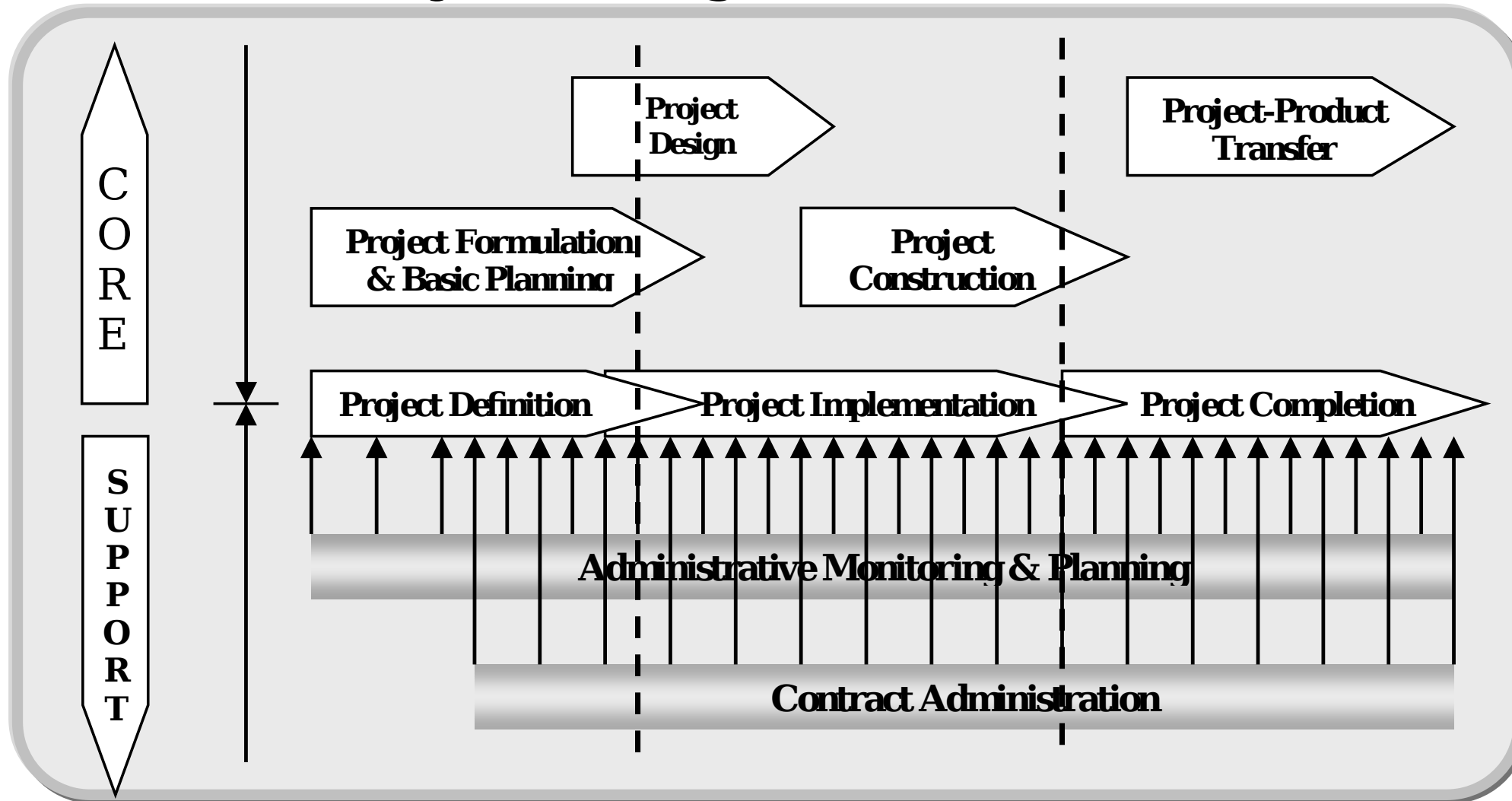
• The Project management process includes two separate elements.

- The first includes **two processes** which were meant for one of the elements that PMBoK used to define a project.
- That is, a project is **temporary and hence has a definite beginning and a definite end.**
- The second one is built upon the **bases of the three well known traditional management functions.**
 - Planning,
 - Executing and
 - Controlling.
- At the same time **these processes are made cyclic** depending on the degree of



4. Project Process Management...

Modified Project Management Process (Source:



5. Project Scope Management

- In the project context, the term scope can refer to:
 - **Product scope**: The features and functions that characterize a product, service, or result
 - **Project scope**: The work performed to deliver a product, service, or result with the specified features and functions.
- **Project Scope Management** includes the processes required to ensure that the project includes **all the work required, and only the work required**, to complete the project successfully.
- Managing the project scope is primarily concerned with defining and controlling **what is and is not included** in the project.

5. Project Scope Management...

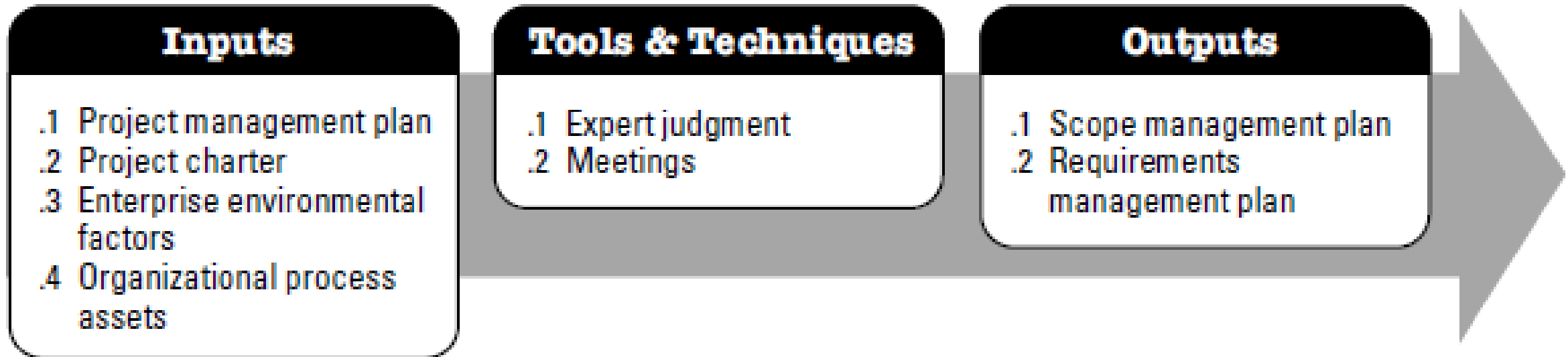
- Project Scope Management processes include the following:

- 1. Plan Scope Management**—The process of creating a scope management plan documents **how the project scope will be defined, validated, and controlled**.
- 2. Collect Requirements**—The process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives.
- 3. Define Scope**—The process of developing a detailed description of the project and product.
- 4. Create work breakdown structure (WBS)**—The process of subdividing project deliverables and project work into smaller, more manageable components.
- 5. Validate Scope**—The process of formalizing acceptance of the completed project deliverables.
- 6. Control Scope**—The process of monitoring the status of the project and product scope and managing changes to the scope baseline.

5. Project Scope Management...

1. Plan Scope Management

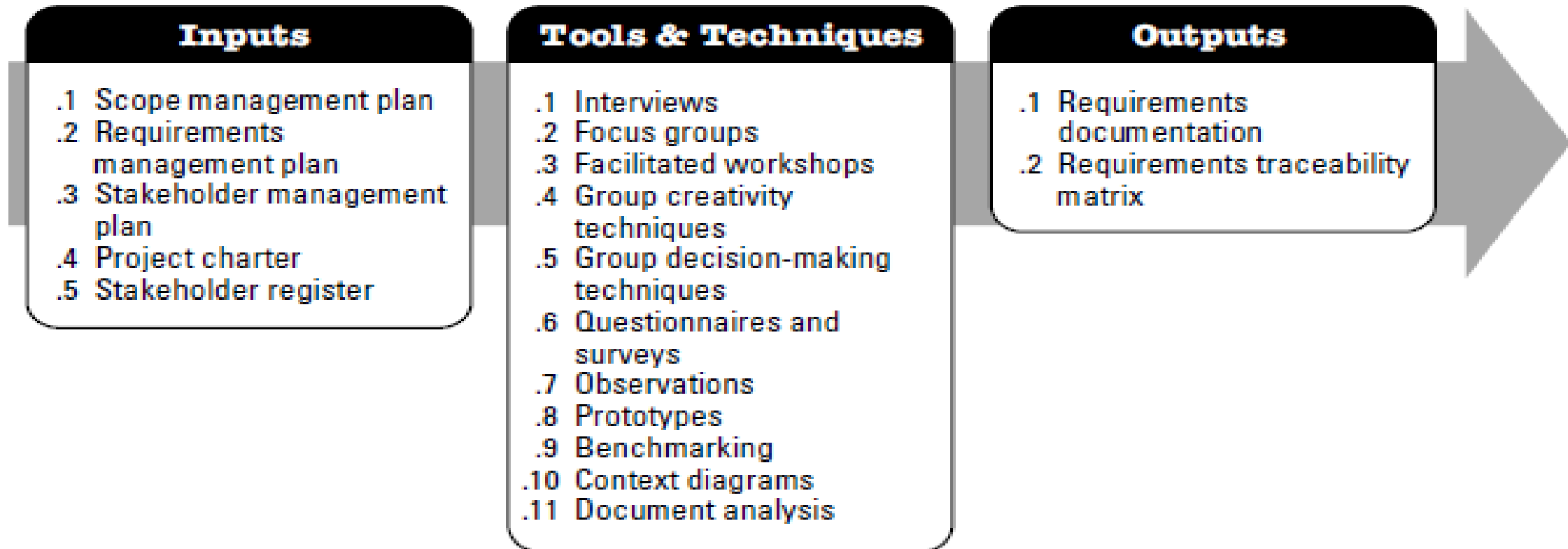
- The key benefit of this process is that it provides guidance and direction on how scope will be managed throughout the project



5. Project Scope Management...

2. Collect Requirements

- The key benefit of this process is that it provides the basis for defining and managing the project scope including product scope.



5. Project Scope Management...

3. Define Scope

- The key benefit of this process is that it describes the product, service, or result boundaries by defining which of the requirements collected will be included in and excluded from the project scope.



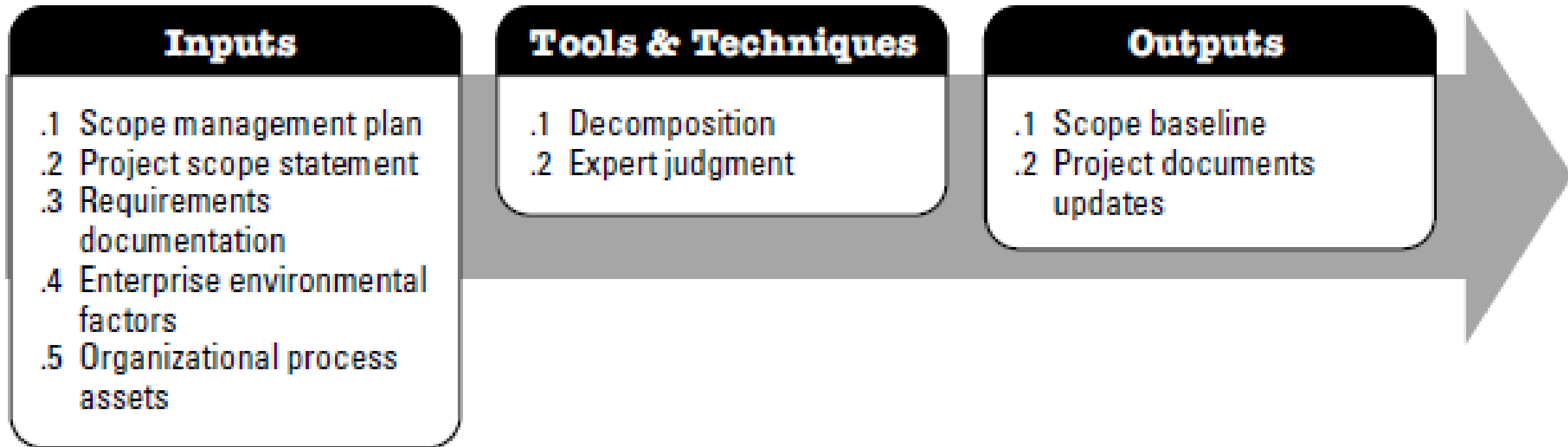
5. Project Scope Management...

4. Create Work Breakdown Structure (WBS)

- The key benefit of this process is that it provides a structured vision of what has to be delivered.
- The WBS is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.
- The WBS organizes and defines the total scope of the project, and represents the work specified in the current approved project scope statement.

5. Project Scope Management...

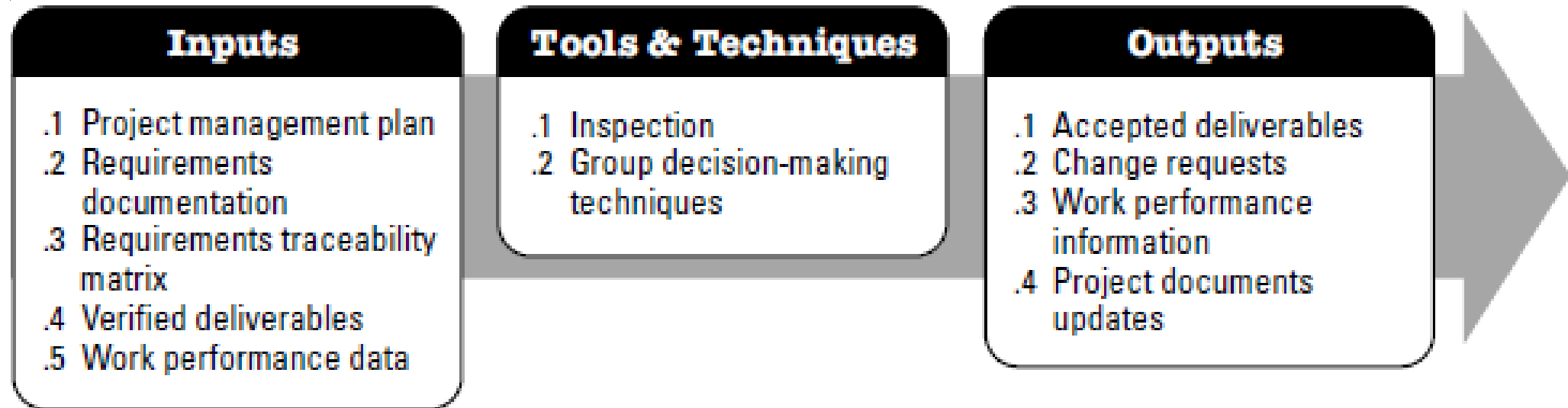
4. Create Work Breakdown Structure (WBS)...



5. Project Scope Management...

5. Validate Scope

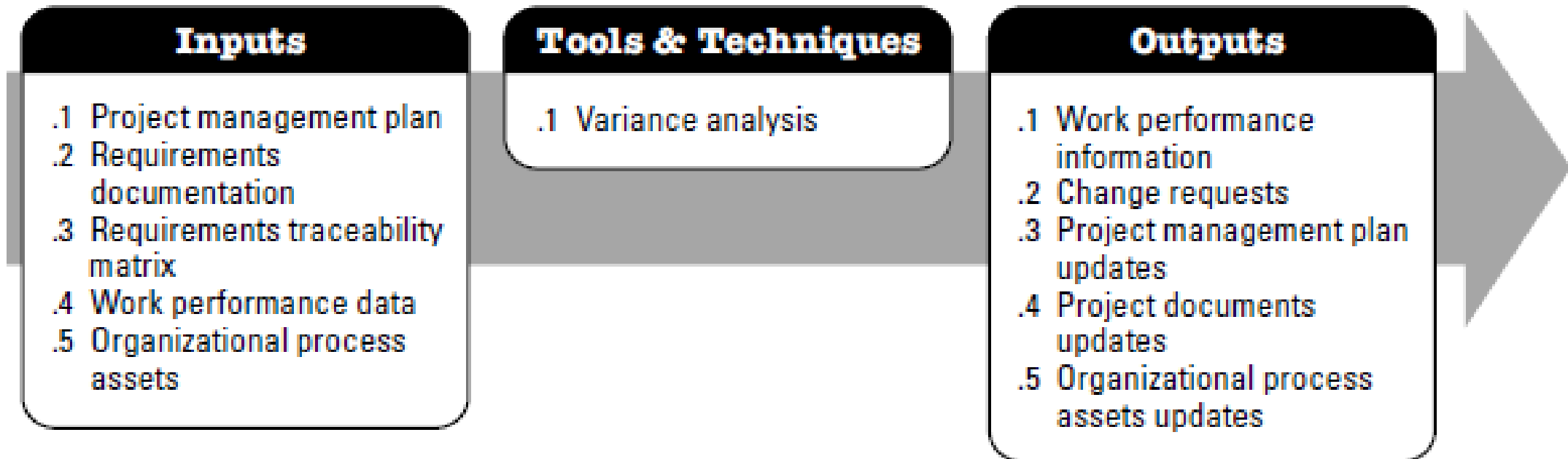
- The key benefit of this process is that it brings objectivity to the acceptance process and increases the chance of final product, service, or result acceptance by validating each deliverable.



5. Project Scope Management...

6. Control Scope

- The key benefit of this process is that it allows the scope baseline to be maintained throughout the project.



6. Project Quality Management

- Quality Management is **an important** project management function.
- It is one of the **critical attributes of project success**, with the others being **cost, time** and **safety**.
- Quality Management involves :
 - Setting Quality Standards to achieve both technical and managerial competence,
 - Scheduling inspections,
 - Managing any required rework,
 - Documentation.

6. Project Quality Management...

- Project Quality Management includes the ***processes and activities of the performing organization that determine quality policies, objectives, and responsibilities*** so that the project will satisfy the needs for which it was undertaken.
- Project Quality Management
 - **uses policies and procedures to implement**, within the project's context, the organization's quality management system and, as appropriate, it supports continuous process improvement activities as undertaken on behalf of the performing organization.
 - **works to ensure that the project requirements, including product requirements, are met and validated.**

6. Project Quality Management...

- Project Quality Management
 - addresses the management of the project and **the deliverables** of the project.
 - It applies to **all projects**, regardless of the nature of their deliverables.
- Project Quality Management processes include:
 1. **Plan Quality Management**
 2. **Perform Quality Assurance**
 3. **Control Quality**

6. Project Quality Management...

- The basic approach to project quality management is intended to be **compatible with International Organization for Standardization (ISO)** quality standards.
- In the context of achieving ISO compatibility, **modern quality management approaches seek to minimize variation** and to deliver results that meet defined requirements.

These approaches recognize the importance of:

- **Customer satisfaction.**
- **Prevention over inspection.**
- **Continuous improvement.**
- **Management Responsibility.**
- **Cost of quality.**

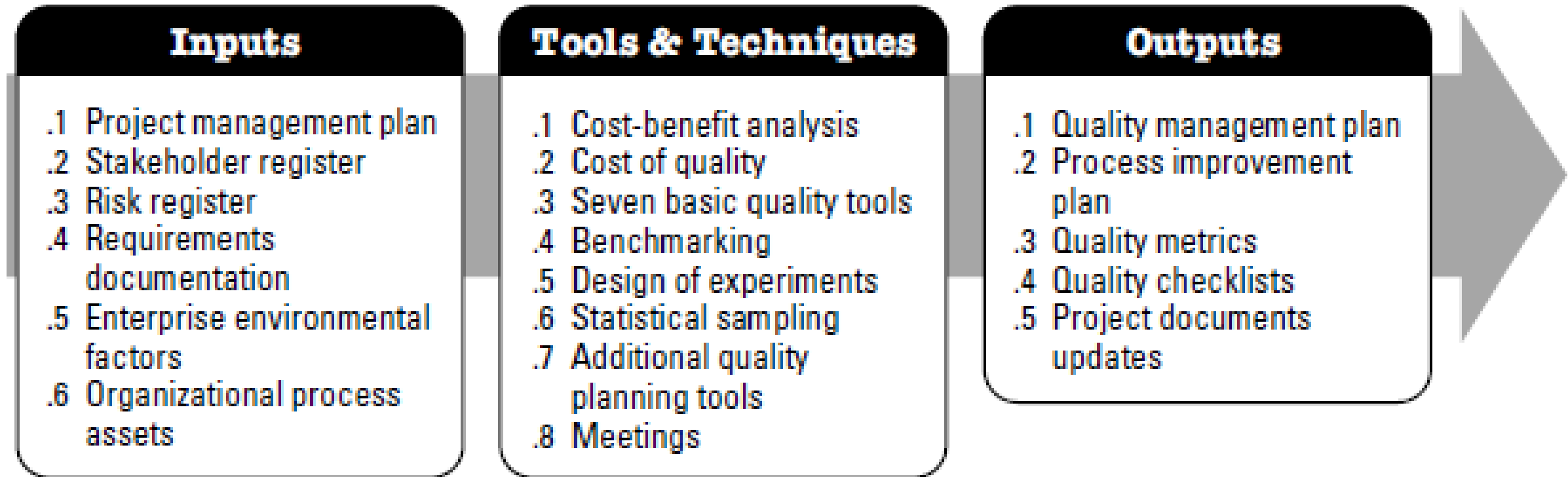
6. Project Quality Management...

1. Plan Quality Management

- Plan Quality Management is the process of
 - **identifying quality requirements and/or standards** for the project and its deliverables, and
 - **documenting how the project will demonstrate compliance** with relevant quality requirements and/or standards.
- The key benefit of this process is that **it provides guidance and direction on how quality will be managed and validated** throughout the project.

6. Project Quality Management...

1. Plan Quality Management...



6. Project Quality Management...

2. Perform Quality Assurance

- It is the **process of auditing the quality requirements** and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used.
- The key benefit of this process is that **it facilitates**



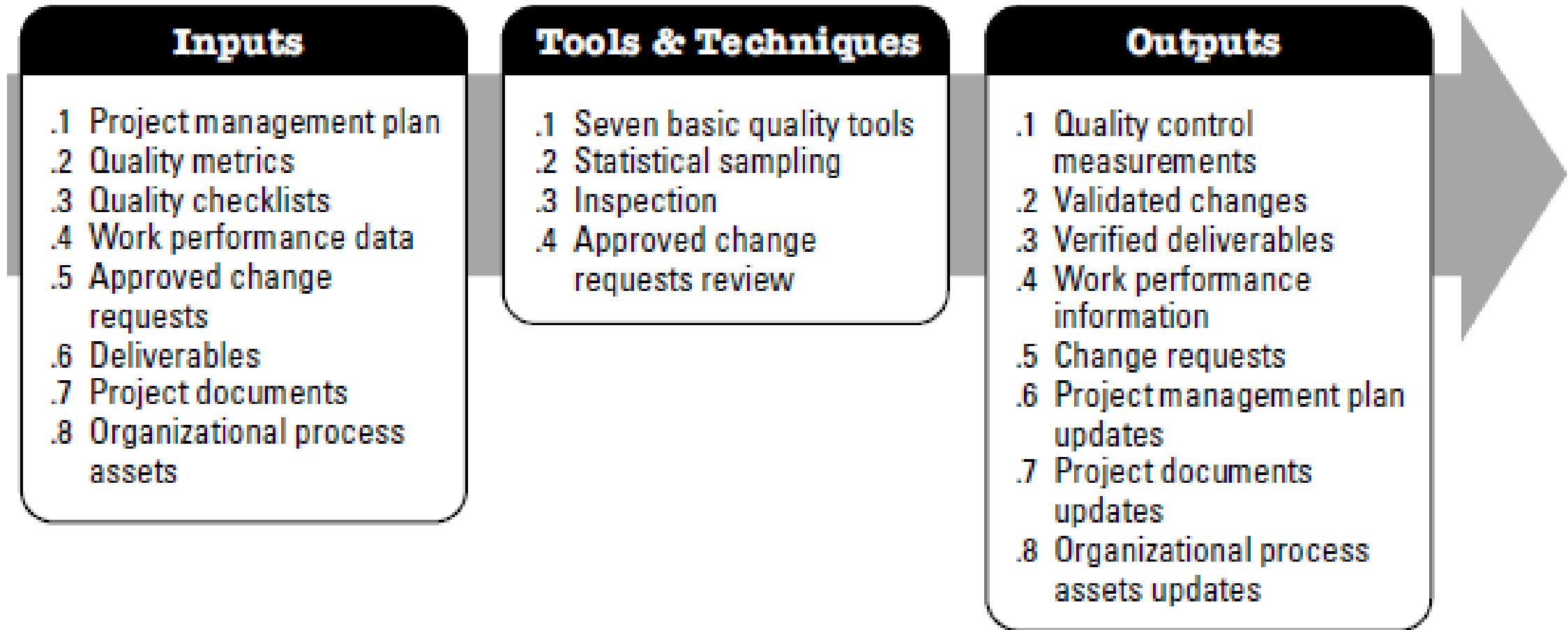
6. Project Quality Management...

3. Control Quality

- Control Quality is **the process of monitoring and recording results of executing the quality activities** to assess performance and recommend necessary changes.
- The key benefits of this process include:
 - (1) **identifying the causes of poor process or product quality** and recommending and/or taking action to eliminate them; and
 - (2) **validating that project deliverables and work meet the requirements specified by key stakeholders** necessary for final acceptance.

6. Project Quality Management...

3. Control Quality...



7. Project Stakeholder Management

- Stakeholders can be defined as **either individuals or units or organization** itself for which they claim a stake in the project such that **they get benefit from or affected by the whole processes of the project and its deliverables.**
- Stakeholders can generally be classified under
 - Internal and
 - External.

7. Project Stakeholder Management...

Roles of Stakeholders

Stakeholders	Roles
Beneficiaries / Users	Demand Emergence; Users
Client / Employer	Demand Recognition; Project Scope Definition; Project Financing; Administration (Limited); Organization and Risk allocations
Consultants	Market Promotion and Study; Demand Articulation; Project Reformulations; Design Implementation and Contract Administration
Constructors	Market Promotion and Study; Project Construction Works Implementation and Contract Administration
Suppliers / Sub contractors	Same as Consultants and Constructors but for Outsourced activities and Input resources
Financiers / Sponsors	Demand Articulations; Project Scope Redefinitions; Project Financing and Monitoring
Public works bodies	Regulatory services for overall implementation of Policies, Standards, Codes, etc
Legislative Bodies	Demand Articulation and Resources Allocation
General Audit	Regulatory services for legislative bodies
Associations / Institutions	Ensuring their interest and ethical implementations of Professions and Human resources development

7. Project Stakeholder Management...

- 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.
- Stakeholder management **focuses on continuous communication with stakeholders to understand their needs and expectations**, addressing issues as they occur, managing conflicting interests and fostering appropriate stakeholder engagement in project decisions and activities.

7. Project Stakeholder Management...

- Stakeholder satisfaction should be managed as a key project objective.
- Every project will have stakeholders who **are impacted by** or can **impact** the project in a positive or negative way.
- The ability of the project manager to correctly identify and manage these stakeholders in an appropriate manner can mean the difference between success and failure.

7. Project Stakeholder Management...

- While some stakeholders may have **a limited ability to influence the project, others may have significant influence** on the project and its expected outcomes.
- Project Stakeholder Management processes include :
 1. **Identify Stakeholder**
 2. **Plan Stakeholder**
 3. **Manage Stakeholder**
 4. **Control Stakeholder**

7. Project Stakeholder Management...

1. Identify Stakeholders

- Identify Stakeholders is the process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project, analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.
- The key benefit of this process is that it allows the project manager to identify the appropriate focus for each stakeholder or group of stakeholders.

7. Project Stakeholder Management...

2. Plan Stakeholder Management

- Plan Stakeholder Management is the **process of developing appropriate management strategies** to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success.
- The key benefit of this process is that **it provides a clear, actionable plan** to interact with project stakeholders to support the project's interests.

7. Project Stakeholder Management...

3. Manage Stakeholder Engagement

- It is the **process of communicating and working with stakeholders**
 - to **meet their needs/expectations**,
 - address issues as they occur, and
 - **foster appropriate stakeholder engagement** in project activities throughout the project life cycle.
- The key benefit of this process is that **it allows the project manager to increase support and minimize resistance from stakeholders** significantly increasing the chances

7. Project Stakeholder Management...

4. Control Stakeholder Engagement

- It is the **process of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.**
- The key benefit of this process is that **it will maintain or increase the efficiency and effectiveness of stakeholder engagement activities** as the project evolves and its environment changes.

8. Project Communications Management

- Project Communications Management includes the **processes that are required to ensure timely and appropriate** planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and the ultimate disposition of project information.
- Project managers spend most of their time **communicating with team members and other project stakeholders**, whether they are internal (at all organizational levels) or external to the organization.

8. Project Communications Management...

- **Effective communication** creates a bridge between diverse stakeholders who may have different cultural and organizational backgrounds, different levels of expertise, and different perspectives and interests, which impact or have an influence upon the project execution or outcome.
- Project Communications Management processes include:
 1. **Plan Communications**
 2. **Manage Communications**
 3. **Control Communications**

8. Project Communications Management...

- The communication activities involved in these processes may often **have many potential dimensions** that need to be considered, including, but not limited to:
 - Internal (within the project) and external (customer, vendors, other projects, organizations, the public);
 - Formal (reports, minutes, briefings) and informal (emails, memos, discussions);
 - Vertical (up and down the organization) and horizontal (with peers);
 - Official (newsletters, annual report) and unofficial (off the record communications); and
 - Written and oral, and verbal (voice inflections) and nonverbal (body language).

8. Project Communications Management...

- Most **communication skills** are common for both general management and project management, such as, but not limited to:
 - Listening actively and effectively;
 - Questioning and probing ideas and situations to ensure better understanding;
 - Educating to increase team's knowledge so that they can be more effective;
 - Fact-finding to identify or confirm information;
 - Setting and managing expectations;
 - Persuading a person, a team, or an organization to perform an action;
 - Motivating to provide encouragement or reassurance;
 - Coaching to improve performance and achieve desired results;
 - Negotiating to achieve mutually acceptable agreements between parties;
 - Resolving conflict to prevent disruptive impacts; and
 - Summarizing, recapping, and identifying the next steps.

8. Project Communications Management...

1. Plan Communications Management

- It is the **process of developing an appropriate approach and plan** for project communications based on stakeholder's information needs and requirements, and available organizational assets.
- The key benefit of this process is that **it identifies and documents the approach to communicate** most effectively and efficiently with stakeholders.

8. Project Communications Management...

2. Manage Communications

- It is the **process of creating, collecting, distributing, storing, retrieving, and the ultimate disposition of project information** in accordance to the communications management plan.
- The key benefit of this process is that **it enables an efficient and effective communications flow** between project stakeholders.

8. Project Communications Management...

3. Control Communications

- Control Communications is ***the process of monitoring and controlling communications throughout the entire project life cycle*** to ensure the information needs of the project stakeholders are met.
- The key benefit of this process is that **it ensures an optimal information flow** among all communication participants, at any moment in time.

9. Change, Uncertainty and Risk Management

- Uncertainties and Changes in undertaking a public construction project come **from many sources** and often involve many participants and resources.
- The perceptions and attitude of practitioners towards uncertainties and changes matters a lot in effective performance determinations.

9. Change, Uncertainty and Risk Management...

- **classify project uncertainties** in a number of ways. These included:
 1. ***Socioeconomic factors***: Environmental protection, Public works and safety regulations, Economic instability, Political instability, Unreliability of worker performance, Unchecked expenditure;
 2. ***Organizational relationships***: Contractual relations, Attitudes of participants, Communication, New competitors, Assignment of resources, Appointment of new head, Uncertain engineering responsibility;
 3. ***Scientific or Technical Uncertainty***: True scientific uncertainty, Uncertainty due to the high cost of knowledge, Time dependent uncertainty (Information), Design assumptions, Site conditions, Construction procedures, Construction occupational safety; and
 4. ***Uncertainty of objectives***: Integration among the strategic, tactical and operational objectives, Different objectives among stakeholders, Risk Reward trade off

9. Change, Uncertainty and Risk Management...

- Project risk is **an uncertain event or condition that, if it occurs, has a positive or negative effect** on one or more project objectives such as scope, schedule, cost, and quality.
- A risk may have **one or more causes** and, if it occurs, it may have one or more impacts.
- A cause may be a given or potential requirement, assumption, constraint, or condition that creates the possibility of **negative or positive outcomes**.

9. Change, Uncertainty and Risk Management...

- The risk attitudes of both the organization and the stakeholders broadly classified into three themes:
 - ***Risk appetite***, which is the degree of uncertainty an entity is willing to take on in anticipation of a reward.
 - ***Risk tolerance***, which is the degree, amount, or volume of risk that an organization or individual will withstand.
 - ***Risk threshold***, which refers to measures along the level of uncertainty or the level of impact at which a stakeholder may have a specific interest. **Below that risk threshold, the organization will accept the risk.** Above that risk threshold, the organization will not tolerate the risk.

9. Change, Uncertainty and Risk Management...

- Project Risk Management includes the **processes of conducting risk management planning, identification, analysis, response, and controlling risk on a project.**
- The objectives of project risk management are
 - **to increase** the likelihood and impact of positive events, and
 - **To decrease** the likelihood and impact of negative events in the project.

9. Change, Uncertainty and Risk Management...

- Project Risk Management processes include:
 - 1. Plan Risk Management**
 - 2. Identify Risks**
 - 3. Perform Qualitative Risk Analysis**
 - 4. Perform Quantitative Risk Analysis**
 - 5. Plan Risk Responses**
 - 6. Control Risks**

9. Change, Uncertainty and Risk Management...

1. Plan Risk Management

- Plan Risk Management is the **process of defining how to conduct risk management activities for a project.**
- The key benefit of this process is **it ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization.**
- The risk management plan is **vital to communicate with and obtain agreement and support from all stakeholders** to ensure the risk management process is supported and performed effectively over the project life cycle.

9. Change, Uncertainty and Risk Management...

2. Identify Risks

- **Identify Risks is the process of determining which risks may affect the project and documenting their characteristics.**
- The key benefit of this process is the documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events.

9. Change, Uncertainty and Risk Management...

3. Perform Qualitative Risk Analysis

- **Perform Qualitative Risk Analysis is the process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.**
- The key benefit of this process is that it enables project managers to reduce the level of uncertainty and to focus on high-priority risks.

9. Change, Uncertainty and Risk Management...

4. Perform Quantitative Risk Analysis

- Perform Quantitative Risk Analysis is **the process of numerically analyzing the effect of identified risks** on overall project objectives.
- The key benefit of this process is that **it produces quantitative risk information** to support decision making in order to reduce project uncertainty.

9. Change, Uncertainty and Risk Management...

5. Plan Risk Responses

- Plan Risk Responses is the **process of developing options and actions to enhance opportunities** and to reduce threats to project objectives.
- The key benefit of this process is that **it addresses the risks by their priority, inserting resources and activities into the budget,** schedule and project management plan as needed.

9. Change, Uncertainty and Risk Management...

6. Control Risks

- Control Risks is the **process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.**
- The key benefit of this process is that it **improves efficiency of the risk approach** throughout the project life cycle to continuously optimize risk responses.

Thank you!