



哈爾濱工業大學
HARBIN INSTITUTE OF TECHNOLOGY



Chapter 4

Project Integration Management

Time Management

1. Activity Definition
2. Activity Sequencing
3. Activity Resource Estimating
4. Activity Duration Estimating
5. Schedule Development
6. Schedule Control

Cost Management

1. Cost Estimating
2. Cost Budgeting
3. Cost Control

Scope Management

1. Collect Requirements
2. Scope Definition
3. Create WBS
4. Scope Verification
5. Scope Control

Project Integration Management

1. Develop Project Charter
2. Develop Project Management Plan
3. Direct and Manage Project Execution
4. Monitor and Control Project Work
5. Integrated Change Control
6. Close Project or phases

Human Resource Management

1. Human Resource Planning
2. Acquire Project Team
3. Develop Project Team
4. Manage Project Team

Quality Management

1. Quality Planning
2. Perform Quality Assurance
3. Perform Quality Control

Procurement Management

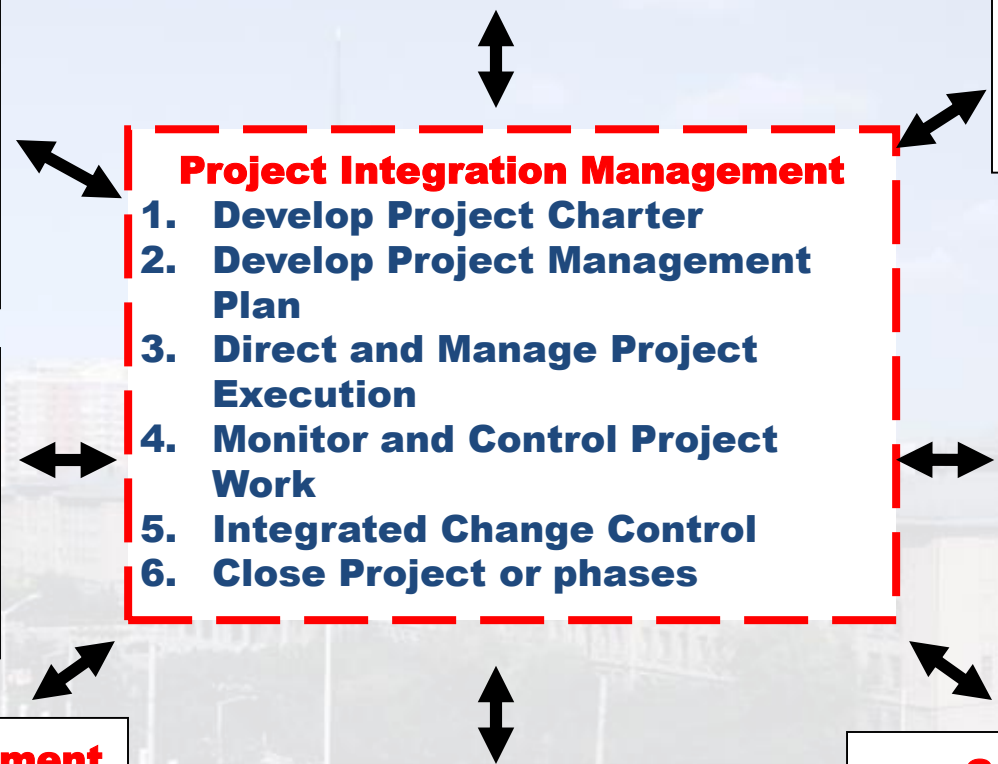
1. Plan Purchases and Acquisitions
2. Conduct Procurements
3. Administer Procurements
4. Close Procurements

Risk Management

1. Risk Management Planning
2. Risk Identification
3. Qualitative Risk Analysis
4. Quantitative Risk Analysis
5. Risk Response Planning
6. Risk Monitoring and Control

Communications Management

1. Identify Stakeholders
2. Communications Planning
3. Information Distribution
4. Performance Reporting
5. Manage Stakeholders





4 Project Integration Management



- 4.1 Develop Project Charter**
- 4.2 Develop Project Management Plan**
- 4.3 Direct and Manage Project Execution**
- 4.4 Monitor and Control Project Work**
- 4.5 Integrated Change Control**
- 4.6 Close Project**



4 Project Integration Management



Introduction

- **Project integration management is the heart of project management and is made up of the day-to-day processes the project manager relies on to ensure that all of the parts of the project work together.**
- **Identify, define the various processes and project management activities, and make them coordinate , combine, unify properly**



4 Project Integration Management



Introduction

- **Make choices about where to concentrate resources and effort on any given day, anticipate potential issues, deal with these issues before they become critical, and coordinate work for the overall project good.**
- **The integration effort also involves making trade-offs among competing objectives and alternatives.**



4 Project Integration Management



Introduction

- **The project management processes are usually presented as discrete components with well-defined interfaces while, in practice, they overlap and interact. The need for integration in project management becomes evident in situations where individual processes interact.**

Mapping of the Project Management Processes

The Knowledge Areas	Process Groups				
	Initiating	Planning	Executing	Controlling	Closing
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4.1 Developing Project Charter



- The project charter is **the document that formally authorizes a project.**
- A project manager is **identified and assigned in the document, as early as feasible.** The project manager should always be assigned prior to **the start of planning**, and preferably while the project charter is being developed.
- The project charter provides the **project manager with the authority to apply organizational resources to project activities.**



4.1 Developing Project Charter



- **Documenting initial requirements that satisfy the stakeholders' needs and expectations.**
- **It establishes a partnership between the performing organization and the requesting organization . Chartering a project links the project to the ongoing work of the organization.**
- **“Someone” from senior-level management within an organization, at a level that is appropriate to funding the project, issues the project charter.**





4.1 Developing Project Charter

Contents of Project Charter

The project charter should address the following information:

- Requirements that **satisfy** customer, sponsor, and other stakeholder **needs, wants and expectations**
- Business needs, **high-level project description**, or product requirements that the project is undertaken to address
- **Project purpose or justification**
- **Assigned Project Manager and authority level**



4.1 Developing Project Charter



Contents of Project Charter

- **Summary milestone schedule**
- **Stakeholder influences**
- **Functional organizations and their participation**
- **Organizational, environmental and external assumptions**
- **Organizational, environmental and external constraints**
- **Business case justifying the project, including return on investment**
- **Summary budget.**



4.1 Developing Project Charter



Process of Developing Project Charter

Inputs

- .1 Project statement of work
- .2 Business case
- .3 Contract
- .4 Enterprise environmental factors
- .5 Organizational process assets

Tools & Techniques

- .1 Expert judgment

Outputs

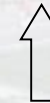
- .1 Project charter



Information



Methods



Documents



4.1 Developing Project Charter



Input

a) Statement of Work

The statement of work (SOW) is a narrative description of products or services to be supplied by the project.

- **For internal projects, the project initiator or sponsor provides SOW.**
- **For external projects, SOW can be received from the customer.**



4.1 Developing Project Charter



Input

a) Statement of Work

- **Business need – an organization’s business need can be based on needed training, market demand, technological advance, legal requirement, or governmental standard.**
- **Product scope description – documents the product requirements and characteristics of the product or service that the project will be undertaken to create.**



4.1 Developing Project Charter



Input

a) Statement of Work

- **Strategic plan. The strategic plan documents the organization's strategic goals. Therefore, all projects should be aligned with the strategic plan.**



4.1 Developing Project Charter



Input

b) Statement of Work

- **The product requirements will generally have less detail during the initiation process and more detail during later processes, as the product characteristics are progressively elaborated.**
- **These requirements should also document the relationship among the products or services being created and the business need or other stimulus that causes the need.**



4.1 Developing Project Charter



Input

b) Statement of Work

- **While the form and substance of the product requirements document will vary, it should always be detailed enough to support later project planning.**



4.1 Developing Project Charter



Input

b) Business Case: The business case or similar document provides the necessary information from a business standpoint to determine whether or not the project is worth the required investment. Typically the business need and the cost-benefit analysis are contained in the business case to justify the project.



4.1 Developing Project Charter



Input

b) Business Case: The business case is created as a result of one or more of the following:

- **Market demand**
- **Organizational need**
- **Customer request**
- **Technological**
- **Legal requirement**



4.1 Developing Project Charter



Input

c) Contract (When Applicable):

A contract from the customer's acquiring organization is an input if the project is being done for an external customer.



4.1 Developing Project Charter



Input

d) Enterprise Environmental Factors:

Any and all of the organization's enterprise environmental factors and systems that surround and influence the project's success



4.1 Developing Project Charter



Input

d) Enterprise Environmental Factors:

include items such as, but not limited to:

- **Strategic plan – all projects should support the organization's strategic goals. The strategic plan of the performing organization should be considered as a factor when making project selection decisions.**
- **Organizational or company culture and structure**
- **Infrastructure (e.g., existing facilities and capital equipment)**

The Dept. of Industry Engineering



4.1 Developing Project Charter



Input

d) Enterprise Environmental Factors:

- **Existing human resources (e.g., skills, disciplines, and knowledge, such as design, development, legal, contracting, and purchasing)**
- **Personnel administration (e.g., hiring and firing guidelines, employee performance reviews, and training records)**



4.1 Developing Project Charter



Input

d) Enterprise Environmental Factors:

- **Company work authorization system**
- **Marketplace conditions**
- **Stakeholder risk tolerances**
- **Governmental or industry standards (e.g., regulatory agency regulations, product standards, quality standards, and workmanship standards)**



4.1 Developing Project Charter



Input

e) The organizational process assets :

- **Organization's processes and procedures for conducting work (体系文件)**
- **Organizational corporate knowledge base for storing and retrieving information (知识库信息管理)**



4.1 Developing Project Charter



Input

- **Organization's processes and procedures for conducting work(体系文件):**
 - ✓ **Organizational standard processes,**
 - **standards, policies (safety and health policy, and project management policy)**
 - **standard product and project life cycles, and quality policies and procedures (process audits, improvement targets, checklists, and standardized process definitions for use in the organization)**



4.1 Developing Project Charter



Input

- **Organization's processes and procedures for conducting work:**
 - ✓ **Standardized guidelines, work instructions, proposal evaluation criteria, and performance measurement criteria**
 - ✓ **Templates (e.g., risk templates, work breakdown structure templates, and project schedule network diagram templates)**



4.1 Developing Project Charter



Input

- **Organization's processes and procedures for conducting work:**
 - ✓ **Guidelines and criteria for modifying the organization's set of standard processes to satisfy the specific needs of the project**
 - ✓ **Organization communication requirements (e.g., specific communication technology available, allowed communication media, record retention, and security requirements)**



4.1 Developing Project Charter



Input

- **Organization's processes and procedures for conducting work:**
 - ✓ **Project closure guidelines or requirements (e.g., final project audits, project evaluations, product validations, and acceptance criteria)**
 - ✓ **Financial controls procedures (e.g., time reporting, required expenditure and disbursement reviews, accounting codes, and standard contract provisions)**



4.1 Developing Project Charter



Input

- **Organization's processes and procedures for conducting work:**
 - ✓ **Issue and defect management procedures defining issue and defect controls, issue and defect identification and resolution, and action item tracking.**
 - ✓ **Risk control procedures, including risk categories, probability definition and impact, and probability and impact matrix**



4.1 Developing Project Charter



Input

- **Organization's processes and procedures for conducting work:**
 - ✓ **Change control procedures, including the steps by which official company standards, policies, plans, and procedures—or any project documents—will be modified, and how any changes will be approved and validated**
 - ✓ **Procedures for approving and issuing work authorizations**



4.1 Developing Project Charter



Input

- **Organizational corporate knowledge base for storing and retrieving information:**
 - ✓ **Process measurement database used to collect and make available measurement data on processes and products**
 - ✓ **Project files (e.g., scope, cost, schedule, and quality baselines, performance measurement baselines, project calendars, project schedule network diagrams, risk registers, planned response actions, and defined risk impact)**



4.1 Developing Project Charter



Input

- **Organizational corporate knowledge base for storing and retrieving information:**
 - ✓ **Historical information and lessons learned knowledge base (e.g., project records and documents, all project closure information and documentation, information about both the results of previous project selection decisions and previous project performance information, and information from the risk management effort)**



4.1 Developing Project Charter



Input

- **Organizational corporate knowledge base for storing and retrieving information:**
 - ✓ **Configuration management knowledge base containing the versions and baselines of all official company standards, policies, procedures, and any project documents**



4.1 Developing Project Charter



Input

- **Organizational corporate knowledge base for storing and retrieving information:**
 - ✓ **Issue and defect management database containing issue and defect status, control information, issue and defect resolution, and action item results**
 - ✓ **Financial database containing information such as labor hours, incurred costs, budgets, and any project cost overruns.**



4.1 Developing Project Charter



Tools and Techniques

a) Expert Judgment

Judgment provided based upon expertise in an application area, knowledge area, discipline, industry, etc. as appropriate for the activity being performed. Such expertise may be provided by any group or person with specialized education, knowledge, skill, experience, or training, and is available from many sources, including:



4.1 Developing Project Charter



Tools and Techniques

a) Expert Judgment

- **Other units within the organization**
- **Consultants**
- **Stakeholders, including customers or sponsors**
- **Professional and technical associations**
- **Industry groups.**



4.1 Developing Project Charter



Outputs Project Charter

- **Introduction (Business case, Contract, SOW)**
 - **Project Background and Rationale: How did we get here? Why do we want to do this project? Why do we want to do it now?**
 - **Project Objectives: What specific problem is this project trying to solve and what would constitute an acceptable solution? How will the infrastructure be different once the project is successfully completed?**



4.1 Developing Project Charter



Outputs Project Charter

● Introduction

- **Scope: Identify project boundaries, what's included, and what is not covered by this project**
- **Project Deliverables: List all of the major items to be delivered, delivery dates, delivery locations, delivery method and quantities necessary to satisfy the project's requirements.**



4.1 Developing Project Charter



Outputs Project Charter

- **Introduction**

- **Milestones: List those significant points that will occur during the execution of the project that can be used to assess its progress.**



4.1 Developing Project Charter

Outputs Project Charter

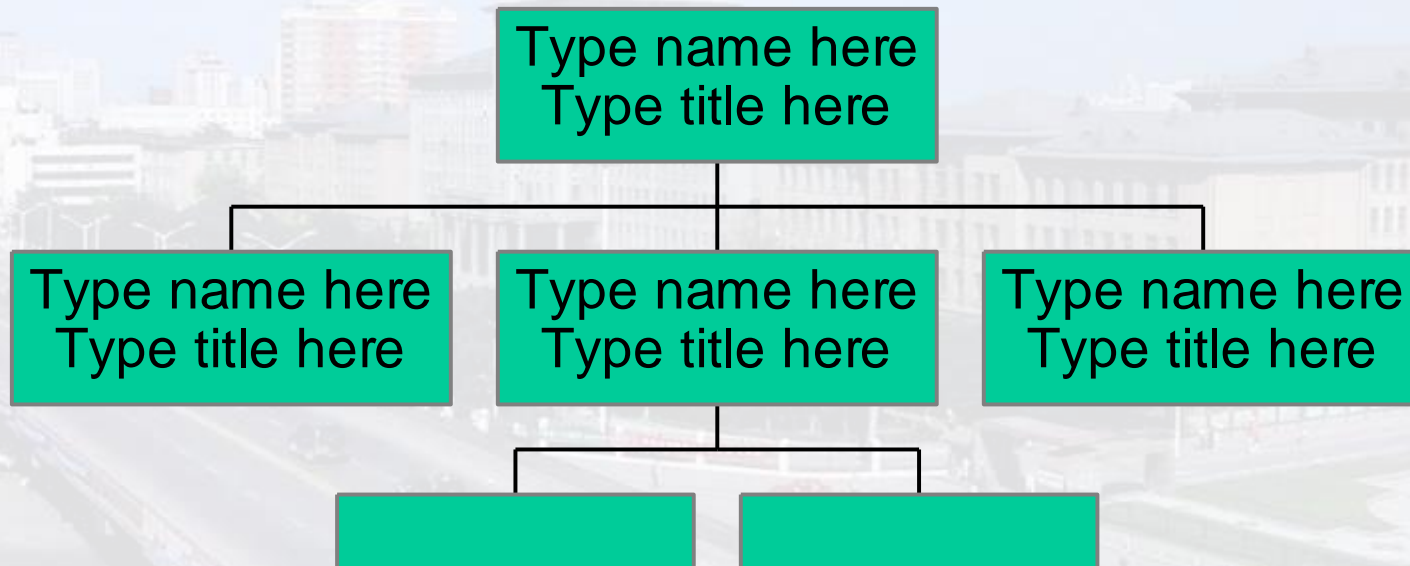
- **Project Organization (environmental factors and organizational process assets)**
 - **Organizational Structure: Describe the internal management structure of the project. Use an organization chart to describe the lines of authority and reporting within the project.**



4.1 Developing Project Charter

Outputs Project Charter

- **Project Organization (environmental factors and organizational process assets)**





4.1 Developing Project Charter



Outputs Project Charter

● Project Organization

➤ Project Responsibilities: Use a RASCI

➤ **R: responsible** (负责, 执行任务的角色, 他/她具体负责操控项目、解决问题。)

➤ **A: accountable** (批准, 即对任务负全责的角色, 只有经他/她同意或签署之后, 项目才能得以进行)

➤ **S: Supportive** (协助, 辅助执行任务的人员)

➤ **C: Consulted** (咨询, 拥有完成项目所需的信息或能力的人员)

➤ **I: informed** (通报, 拥有特权、应及时被通知结果的人员, 却不必向他/她咨询、征求意见)



Roles and Responsibilities Definition Matrix Example

Activities	Project Participants									
	Project Manager	Project Team Leader	Project Team Member	Project Technical Lead	Account Manager	Business Relations Specialist	SE Supervisor	SE Manager	Project Owner	Customer Team Member
Establish project Start-Up team	R	S			A					S
Create Project Workbook	A	R	S	S		S				S
Develop Start-Up project plan	R	R	S	S	C	S	S	S	A	S
Establish customer relationship	R	S	S	S	S	S				S
Outline project scope	R	S	S	S	C	S	S		A	S
Set up project management environment	R	S	S		A		C	C		
Establish change management process	A	R	S	S			S	S	S	
Determine financial procedures	R	R			A				S	S
Identify project risk	R	S	S	S	I	S	R	R	R	S
Announce project	R				A				S	S
Review project Start-Up	R	S	S	S		S	S	S		S

Key

R = Responsible for the process

A = Approves/accepts the deliverables from the process

S = Supports steps in the production of the deliverables

I = Information needed about the status and content of the deliverables

C = Consult for inputs, information, and/or contributory deliverables

* For each role you choose to use on your project, you should include a narrative role definition on an attachment.



4.1 Developing Project Charter



Outputs Project Charter

- **Managerial Process**

- **Assumptions: Describe the assumptions upon which the project plans are based.**

- ✓ **Assumption are something/situation that can effect the project but you cannot control.**

- ✓ **Availability of a hardware/software platform**

- ✓ **No nature disaster.**



4.1 Developing Project Charter



Outputs Project Charter

- **Managerial Process**

- **Constraints: Constraints are conditions outside the control of the project that limit the design alternatives.**

- ✓ **Government regulations**

- ✓ **Standards imposed on the solution**

- ✓ **Strategic decisions**



4.1 Developing Project Charter



Outputs Project Charter

● Managerial Process

- **Risk Management: Describe any serious risks that might affect the project and how you plan to deal with them.**
- **Monitoring and Controlling Mechanisms: Describe how project scope, cost, schedule and quality will be tracked throughout the project. How often will the reviews take place, with whom?**
- **Quality Plan : ISO, 6σ**



4.1 Developing Project Charter

Outputs Project Charter

- **Budget**

Describe the project's budget allocated to capital, staffing costs, and consulting

- **Acceptance**

Project Member	Signature	Date
Director		
Deputy Director		
Business Sponsor & Project Director		
Chief Information Officer		



- 根据你的硕士学习制定项目章程



4.2 Develop Project Management Plan



- **Develop Project Management Plan is the process of documenting the actions necessary to define, prepare, integrate, and coordinate **all subsidiary plans.****



4.2 Develop Project Management Plan



- **Subsidiary plans include, but are not limited to:**

- **Project scope management plan**
- **Schedule management plan**
- **Cost management plan**
- **Quality management plan**
- **Process improvement plan**
- **Staffing management plan**
- **Communication management plan**
- **Risk management plan**
- **Procurement management plan**



4.2 Develop Project Management Plan



● **These other components include, but are not limited to:**

- **Milestone list**
- **Resource calendar**
- **Schedule baseline**
- **Cost baseline**
- **Quality baseline**
- **Risk register**

But not a museum piece.



4.2 Develop Project Management Plan



- **A project management plan contains several baselines. As the project moves toward completion, management, stakeholders, and the project manager can use the project management plan to see what was predicted for costs, scheduling, quality, and scope-and then see how these predictions compare with what is being experienced.**



4.2 Develop Project Management Plan



- **Defines how the project is executed, monitored and controlled, and closed.**
- **The content will vary depending upon the application area and complexity of the project.**
- **The project management plan is developed through a series of integrated processes until project closure.**



4.2 Develop Project Management Plan



- **This process results in a project management plan that is progressively elaborated by updates and controlled and approved through the Perform Integrated Change Control.**

Mapping of the Project Management Processes

The Knowledge Areas	Process Groups				
	Initiating	Planning	Executing	Controlling	Closing
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4.2 Develop Project Management Plan



Process of Developing Project Management Plan

Inputs

- .1 Project charter
- .2 Outputs from planning processes
- .3 Enterprise environmental factors
- .4 Organizational process assets

Tools & Techniques

- .1 Expert judgment

Outputs

- .1 Project management plan





4.2 Develop Project Management Plan

Inputs

a) Project Charter

b) outputs from Planning Processes: Outputs from many of the planning processes are integrated to create the project management plan. Any baselines and subsidiary management plans that are an output from other planning processes are inputs to this process. In addition, updates to these documents can necessitate updates to the project management plan.



4.2 Develop Project Management Plan

Inputs

- b) enterprise environmental Factors: The enterprise environmental factors that can influence the Develop Project Management Plan process include, but are not limited to:**
- **Governmental or industry standards**
 - **Project management information systems (software tool, a configuration management system, an information collection and distribution system, or web interfaces to other online automated systems)**



4.2 Develop Project Management Plan

Inputs

b) enterprise environmental Factors:

- **Organizational structure and culture,**
- **Infrastructure (e.g., existing facilities and capital equipment), and**
- **Personnel administration (e.g., hiring and firing guidelines, employee performance reviews, and training records).**



4.2 Develop Project Management Plan



Inputs

- c) organizational Process assets: it can influence the Develop Project Management Plan process include, but are not limited to:**
- **Standardized guidelines, work instructions, proposal evaluation criteria, and performance measurement criteria**



4.2 Develop Project Management Plan

Inputs

c) organizational Process assets:

- **Project management plan template—
Elements of the project management plan that may be updated include, but are not limited to:**
 - ✓ **Guidelines and criteria for tailoring the organization's set of standard processes to satisfy the specific needs of the project**
 - ✓ **Project closure guidelines or requirements like the product validation and acceptance criteria**



4.2 Develop Project Management Plan

Inputs

c) organizational Process assets:

- **Change control procedures including the steps by which official company standards, policies, plans, and procedures, or any project documents will be modified and how any changes will be approved and validated**
- **Project files from past projects (e.g., scope, cost, schedule and performance measurement baselines, project calendars, project schedule network diagrams, risk registers)**



4.2 Develop Project Management Plan

Inputs

c) organizational Process assets:

- **Historical information and lessons learned knowledge base, and**
- **Configuration management knowledge base containing the versions and baselines of all official company standards, policies, procedures, and any project documents.**



4.2 Develop Project Management Plan

Tools and Techniques

a) expert judgment: When developing the project management plan, expert judgment is utilized to:

- **Tailor the process to meet the project needs**
- **Develop technical and management details to be included in the project management plan**
- **Determine resources and skill levels needed to perform project work**



4.2 Develop Project Management Plan

Outputs

- a) Project Management Plan: The project management plan documents the collection of outputs of the planning processes of the Planning Process Group and includes:**
- **The project management processes selected by the project management team**
 - **The level of implementation of each selected process**



4.2 Develop Project Management Plan

Outputs

a) Project Management Plan

- **The descriptions of the tools and techniques to be used for accomplishing those processes**
- **How the selected processes will be used to manage the specific project, including the dependencies and interactions among those processes, and the essential inputs and outputs and pending decisions.**



4.2 Develop Project Management Plan



Outputs

a) Project Management Plan

- **How work will be executed to accomplish the project objectives (技术路线)**
- **How changes will be monitored and controlled (变更控制)**
- **How configuration management will be performed (状态管理)**



4.2 Develop Project Management Plan

Outputs

a) Project Management Plan

- **How integrity of the performance measurement baselines will be maintained and used**
- **The need and techniques for communication among stakeholders**
- **The selected project life cycle and, for multi-phase projects, the associated project phases**
- **Key management reviews for content, extent, and timing to facilitate addressing open issues**



4.2 Develop Project Management Plan

Outputs

a) Project Management Plan

The subsidiary plans include, but are not limited to:

- ① Process improvement plan
- ② Schedule management plan
- ③ Project scope management plan
- ④ Schedule management plan
- ⑤ Cost management plan
- ⑥ Quality management plan
- ⑦ Staffing management plan
- ⑧ Communication management plan
- ⑨ Risk management plan
- ⑩ Procurement management plan



4.2 Develop Project Management Plan

Outputs

a) Project Management Plan

These other components include, but are not limited to:

- ① Milestone list
- ② Resource calendar
- ③ Schedule baseline
- ④ Cost baseline
- ⑤ Quality baseline
- ⑥ Risk register





4.3 Direct and Manage Project Execution



- **The product** of the project is created during these execution processes.
- The **largest** percentage of the project **budget** will be **spent** during the project execution processes.
- The **Direct and Manage Project Execution** process requires the project manager and the project team to **perform multiple actions** to execute the project management plan to accomplish **the work** defined in the project **scope statement**.



Mapping of the Project Management Processes



The Knowledge Areas	Process Groups				
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4.3 Direct and Manage Project Execution



● Process of Direct and Manage Project Execution

Inputs

- .1 Project management plan
- .2 Approved change requests
- .3 Enterprise environmental factors
- .4 Organizational process assets

Tools & Techniques

- .1 Expert judgment
- .2 Project management information system

Outputs

- .1 Deliverables
- .2 Work performance information
- .3 Change requests
- .4 Project management plan updates
- .5 Project document updates





4.3 Direct and Manage Project Execution



Outputs

- a) Deliverables Report : An approved deliverable is any unique and verifiable product, result, or capability to perform a service that must be produced to complete a process, phase, or project.**



4.3 Direct and Manage Project Execution



Outputs

b) work Performance Information: Information from project activities is routinely collected as the project progresses. This information can be related to various performance results including, but not limited to:

- **Deliverable status**
- **Schedule progress**
- **Costs incurred**



4.3 Direct and Manage Project Execution



Outputs

b) Work Performance Information

Information on the status of the project activities being performed to accomplish the project work is routinely collected as part of the project management plan execution. This information includes, but is not limited to:

- **Schedule progress showing status information**
- **Deliverables that have been completed and those not completed**
- **Schedule activities that have started and those that have been finished**



4.3 Direct and Manage Project Execution



Outputs

c) Requested Changes: Changes requested to expand or reduce project scope, to modify project cost or budget, or to revise the project schedule are often identified while project work is being performed.



4.3 Direct and Manage Project Execution



Outputs

d) Project management Plan updates: Elements of the project management plan that may be updated include, but are not limited to:

- **Requirements management plan,**
- **Schedule management plan,**
- **Cost management plan,**
- **Quality management plan,**
- **Human resource plan,**
- **Communications management plan,**
- **Risk management plan,**
- **Procurement management plan, and**
- **Project baselines.**



4.3 Direct and Manage Project Execution



Outputs

e) Project Document updates: Project documents that may be updated include, but are not limited to:

- **Requirements documents,**
- **Project logs (issue, assumptions, etc.),**
- **Risk register, and**
- **Stakeholder register.**





4.4 Monitor and Control Project Work

- **The Monitor and Control Project Work process is performed to monitor project processes associated with initiating, planning, executing, and closing. Monitoring is an aspect of project management performed throughout the project.**
- **Monitoring includes collecting, measuring, and disseminating performance information (scope, cost, schedule, quality), and assessing measurements and trends to effect process improvements.**



4.4 Monitor and Control Project Work

The Monitor and Control Project Work process is concerned with:

- **Comparing actual project performance against the project management plan**
- **Assessing performance to determine whether any corrective or preventive actions are indicated, and then recommending those actions as necessary, that is change request.**



4.4 Monitor and Control Project Work

- **Some project managers hate change requests. Change requests can mean additional work, adjustments to the project, or a reduction in scope. They mean additional planning for the project manager, time for consideration, and can be seen as a distraction from the project execution and control.**



4.4 Monitor and Control Project Work

- **Change requests, however, are a very real and expected part of project management. Most change requests are a result of:**
 - **Value-added** The change will reduce costs (this is often due **to technological advances** since the time the project scope was created)
 - **External events** These could be such things **as new laws or industry requirements.**

Mapping of the Project Management Processes

The Knowledge Areas	Process Groups				
	Initiating	Planning	Executing	Controlling	Closing
4. Project Integration Management	<ul style="list-style-type: none"> • 4.1 Develop Project Charter 	<ul style="list-style-type: none"> • 4.2 Develop Project Management Plan 	<ul style="list-style-type: none"> • 4.3 Direct and Manage Project Execution 	<ul style="list-style-type: none"> • 4.4 Monitor and Control Project Work • 4.5 Perform Integrated Change Control 	<ul style="list-style-type: none"> • 4.6 Close Project or Phase
5. Project Scope Management		<ul style="list-style-type: none"> • 5.1 Collect Requirements • 5.2 Define Scope • 5.3 Create WBS 		<ul style="list-style-type: none"> • 5.4 Verify Scope • 5.5 Control Scope 	
6. Project Time Management		<ul style="list-style-type: none"> • 6.1 Define Activities • 6.2 Sequence Activities • 6.3 Estimate Activity Resources • 6.4 Estimate Activity Durations • 6.5 Develop Schedule 		<ul style="list-style-type: none"> • 6.6 Control Schedule 	
7. Project Cost Management		<ul style="list-style-type: none"> • 7.1 Estimate Costs • 7.2 Determine Budget 		<ul style="list-style-type: none"> • 7.3 Control Costs 	



4.4 Monitor and Control Project Work

Process of Monitor and Control Project Work

Inputs

- .1 Project management plan
- .2 Performance reports
- .3 Enterprise environmental factors
- .4 Organizational process assets

Tools & Techniques

- .1 Expert judgment

Outputs

- .1 Change requests
- .2 Project management plan updates
- .3 Project document updates





4.4 Monitor and Control Project Work

Outputs

a) Change Requests: As a result of comparing planned results to actual results, change requests may be issued which may expand, adjust, or reduce project or product scope. Changes can impact the project management plan, project documents, or product deliverables. **Baselines are recommended for changes**



4.4 Monitor and Control Project Work

Outputs

- b) Recommended Corrective Actions: Corrective actions are documented recommendations required to bring expected future project performance into conformance with the project management plan.**
- c) Recommended Preventive Actions: Preventive actions are documented recommendations that reduce the probability of negative consequences associated with project risks.**



4.4 Monitor and Control Project Work

Outputs

d) Recommended Defect Repair: Some defects, which are found during the quality inspection and audit process, are recommended for correction.

All of these have to be approved in the Process of Integrated Change Control



4.5 Integrated Change Control



- **Integrated Change Control is a process of reviewing all change requests, approving changes and controlling changes according to the change control system (organizational process assets) .**
- **It is performed from project inception through completion.**



4.5 Integrated Change Control



- **It is necessary because projects seldom run exactly according to the project management plan. The project management plan, the project scope statement (scope, schedule, cost, quality) must be maintained by carefully and continuously managing changes, either by rejecting changes or by approving changes so those approved changes are incorporated into a revised baseline.**



4.5 Integrated Change Control



The Integrated Change Control process includes the following change management activities in differing levels of detail, based upon the completion of project execution:

- **Reviewing and approving requested changes.**
- **Reviewing and approving all recommended corrective and preventive actions.**
- **Validating defect repair.**
- **Managing the approved changes when and as they occur, by regulating the flow of requested changes.**



4.5 Integrated Change Control



- **Maintaining the integrity of baselines by releasing only approved changes for incorporation into project products or services, and maintaining their related configuration and planning documentation.**
- **Identifying that a change needs to occur or has occurred.**
- **only approved changes are implemented.**



4.5 Integrated Change Control



- **Controlling and updating the scope, cost, budget, schedule and quality requirements based upon approved changes, by **coordinating changes across the entire project.** For example, a proposed schedule change will often affect cost, risk, quality, and staffing.**
- **Documenting the complete impact of requested changes.**
- **Controlling project quality to standards based on quality reports.**



4.5 Integrated Change Control



- **Proposed changes can require new or revised cost estimates, schedule activity sequences, schedule dates, resource requirements, and analysis of risk response alternatives.**
- **These changes can require adjustments to the project management plan, project scope statement, or other project deliverables.**
- **The configuration management system with change control provides a standardized, effective, and efficient process to centrally manage changes within a project.**

Mapping of the Project Management Processes

The Knowledge Areas	Process Groups				
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4.5 Integrated Change Control



Process of Integrated Change Control

Inputs

- .1 Project management plan
- .2 Work performance information
- .3 Change requests
- .4 Enterprise environmental factors
- .5 Organizational process assets

Tools & Techniques

- .1 Expert judgment
- .2 Change control meetings

Outputs

- .1 Change request status updates
- .2 Project management plan updates
- .3 Project document updates





4.5 Integrated Change Control



Outputs

- a) Change request status updates**
- b) Project management plan updates**
- c) Project document updates**





4.6 Close Project



- The end of **each project phase** and the end of **the project** need a closure process.
- It is the documenting of the project results and the acceptance of the product by the customer or the project sponsor.
- It is also needed **should a project be terminated to investigate and document the reasons for actions taken** .



4.6 Close Project



- In multi-phase projects, it **closes out the portion** of the project scope and associated activities applicable **to a given phase**, and transfer the completed or cancelled project
- This process includes finalizing all activities completed across all Project Management Process Groups to formally **close the project** and transfer the completed or cancelled project



4.6 Close Project



- **The Close Project process also establishes the procedures to coordinate activities needed to verify and document the project deliverables, to coordinate and interact to formalize acceptance of those deliverables by the customer or sponsor,**



4.6 Close Project



Two procedures are developed to establish the interactions necessary to perform the closure activities across the entire project or for a project phase:

- a) Administrative closure procedure**
- b) Contract closure procedure**

Mapping of the Project Management Processes

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4.6 Close Project

Process of Close Project

Inputs

- .1 Project management plan
- .2 Accepted deliverables
- .3 Organizational process assets

Tools & Techniques

- .1 Expert judgment

Outputs

- .1 Final product, service, or result transition
- .2 Organizational process assets updates





4.6 Close Project

Outputs

a) Final product, service, or result transition

➤ **Administrative closure procedure:**

- ① **it contains all the activities and the related roles and responsibilities of the **project team members** involved in executing the administrative closure procedure.**
- ② **The procedures to transfer the project products or services to production and/or operations are developed and established.**



4.6 Close Project

Outputs

a) Final product, service, or result transition

➤ **Administrative closure procedure:**

③ **It provides a step by step methodology for administrative closure that addresses:**

- ✓ **Actions and activities to define the stakeholder approval requirements for changes and all levels of deliverables**

(如验收会和鉴定会的形式、投票表决、投票方式)



4.6 Close Project

Outputs

a) **Final product, service, or result transition**

➤ **Administrative closure procedure:**

③ **It provides a step by step methodology for administrative closure that addresses:**

- ✓ **Actions and activities that are necessary to confirm that the project has met all sponsor, customer, and other stakeholders' requirements, verify that all deliverables have been provided and accepted, and validate that completion and exit criteria have been met**

(鉴定会的准备、人员数量、选择方式)



4.6 Close Project

Outputs

a) Final product, service, or result transition

➤ **Administrative closure procedure:**

- ✓ **Actions and activities necessary to satisfy completion or exit criteria for the project.** (鉴定成果的签字)
- ✓ **integrated activities needed to collect project records, analyze project success or failure, gather lessons learned, and archive project information for future use by the organization.** 资料的汇编、整理活动

The Dept. of Industry Engineering



4.6 Close Project

Outputs

a) Final product, service, or result transition

➤ **Contract Closure Procedure:** (针对合同条款)

- ① **This procedure involves both **product verification** (all work completed correctly and satisfactorily) and administrative closure (updating of contract records to reflect final results and archiving that information for future use).**



4.6 Close Project

Outputs

a) Final product, service, or result transition

➤ **Contract Closure Procedure:**

① **This procedure is developed to provide a step-by-step methodology that addresses:**

- ✓ **Activities to define the terms and conditions of the contracts and any required completion or exit criteria for contract closure, as well as define those related activities supporting the formal administrative closure of the project.**



4.6 Close Project

Outputs

a) Final product, service, or result transition

➤ Contract Closure Procedure:

- ① This procedure is developed to provide a step-by-step methodology that addresses:
 - ✓ **All activities and related responsibilities of the project team members, customers, and other stakeholders involved in the contract closure process.**
 - ✓ **The actions performed formally close all contacts associated with the completed project.**



4.6 Close Project

Outputs

- a) Final product, service, or result transition**
 - **Formal acceptance and handover of the final product, service, or result that the project was authorized to produce. The acceptance includes receipt of a formal statement that the terms of the contract have been met.**
 - **Dismiss the project team**



4.6 Close Project

Outputs

b) Organizational Process Assets (Updates):

The sum of the documentation of the project should be organized, structured, and indexed for fast and accurate reference using the configuration management system. . In addition, any databases containing project information should be updated to reflect the completion of the project. A failure to update the databases and project archives can mislead future projects attempting to emulate the current project.



4.6 Close Project

Outputs

b) Organizational Process Assets (Updates):

- **Project Files. Documentation resulting from the project's activities; for example, project management plan, scope, cost, schedule and quality baselines, project calendars, risk registers, planned risk response actions, and risk impact.**



4.6 Close Project

Outputs

b) Organizational Process Assets (Updates):

- **Project closure documents** consist of formal documentation indicating completion of the project and the transfer of the completed project deliverables to others, such as an operations group.



4.6 Close Project

Outputs

b) Organizational Process Assets (Updates):

- **If the project was terminated prior to completion, the formal documentation indicates why the project was terminated, and formalizes the procedures for the transfer of the finished and unfinished deliverables of the cancelled project to others.**



4.6 Close Project

Outputs

b) Organizational Process Assets (Updates):

- **Any time a project includes procurement issues, the contracts, purchase orders, invoices, warranties, and any other financial-related documentation should be indexed and archived for future reference.**



4.6 Close Project

Outputs

b) Organizational Process Assets (Updates):

- **Historical Information.** Historical information and lessons learned information are transferred to the **lessons learned knowledge base** for use by future projects.
- **Update the resource pool:** the project team members get new knowledge and experience are transferred to the **resource pool** for use by future projects.