Chapter 1: Project Management Overview

1. Project and Project Management
   - The Concept
2. Software Project Management
   - The Role and Importance
3. Software Project Management
   - The Main Contents

Review

What is Project?

A temporary endeavor undertaken to create a unique product, service, or result

Project vs. Operation

Project: Temporary, Unique

- A lot of change management

Operation: Repetitive, Continuity

- Remain sustained and continuity

Project, Program, Portfolio

Program:
Related Projects managed in a coordinate way to obtain benefits

Portfolio
a collection of projects, programs, sub-portfolios, and operations managed as a group to achieve strategic objectives

Review

What is Project Management?

The application of knowledge, skills, tools, and techniques to project activities to meet the project requirements

Five progress groups

Initiating, planning, executing, monitoring and controlling, closing

10 knowledge areas

Integration Management, Scope \ Time \ Quality \ Cost \ Stakeholder \ Communication \ Human Resource \ Procurement \ Risk Management

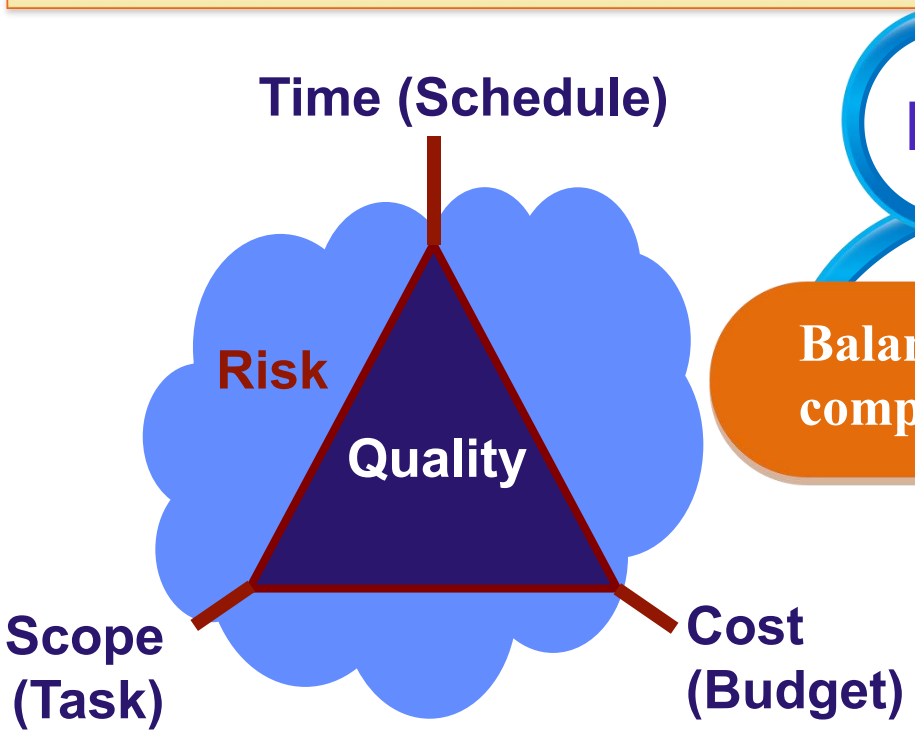
Test

- 1. What is project?
  - Answer： A project is a temporary endeavor undertaken to create a unique product, service, or result.
- 2. What is Project Management?
  - Answer： Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements

Project Manager

The person responsible for accomplishing the project objectives

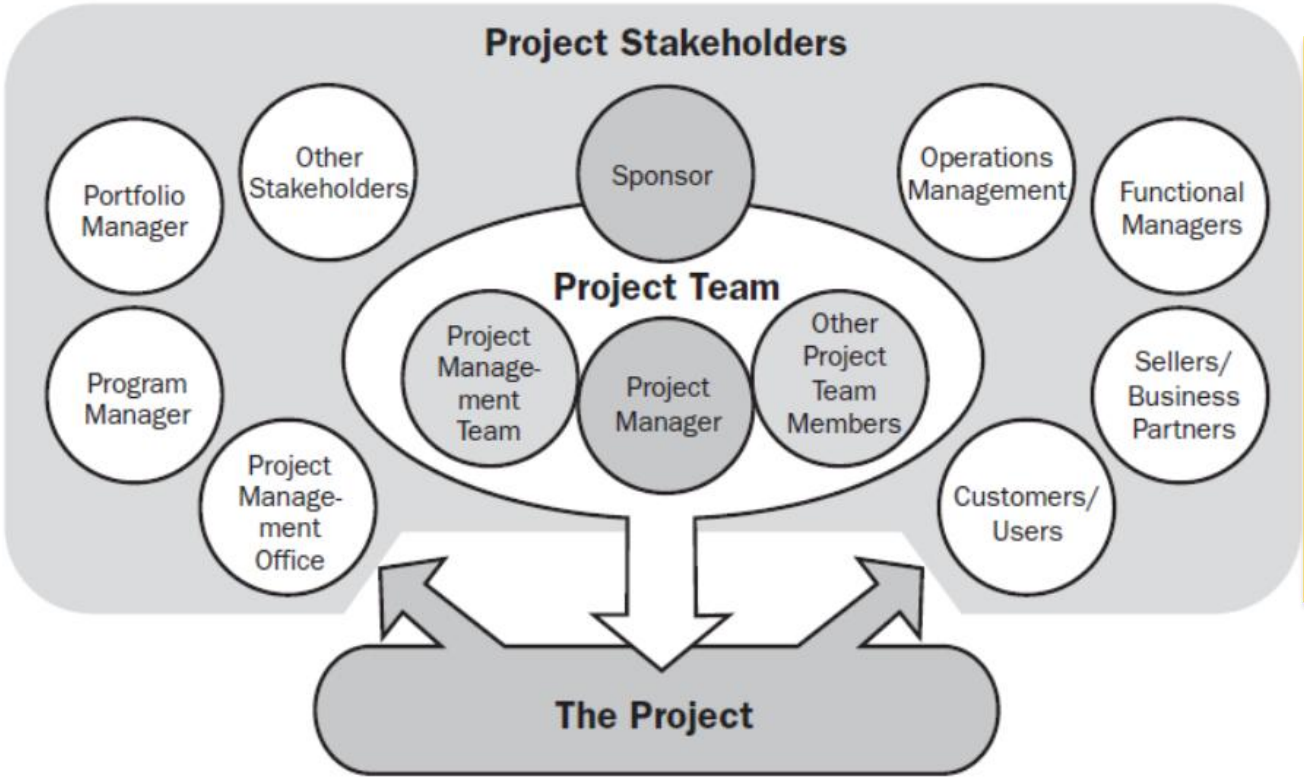
- Leads the project team, Develops/obtains approval for the Project Management Plan
- Ensures the project delivers in accordance with time, cost, scope, quality constraints
- Monitors and controls the plan activities, risks and issues.
- Ensure project milestones are met. Keeps all stakeholders informed of project progress



Stakeholders

An individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project

Project Life Cycle and Organization



All members of the project team; All interested entities that are internal or external to the organization.

Stakeholders

NOTE: Key stakeholders can make or break the success of a project. Even if all the deliverables are met and the objectives are satisfied, *if your key stakeholders aren't happy, nobody's happy.*

Manage the influences of these various stakeholders in relation to the project requirements to ensure a successful outcome.

Has the authority to commence the project and provides the funding
Expects benefits to be realized
Ultimately responsible for the success of the project

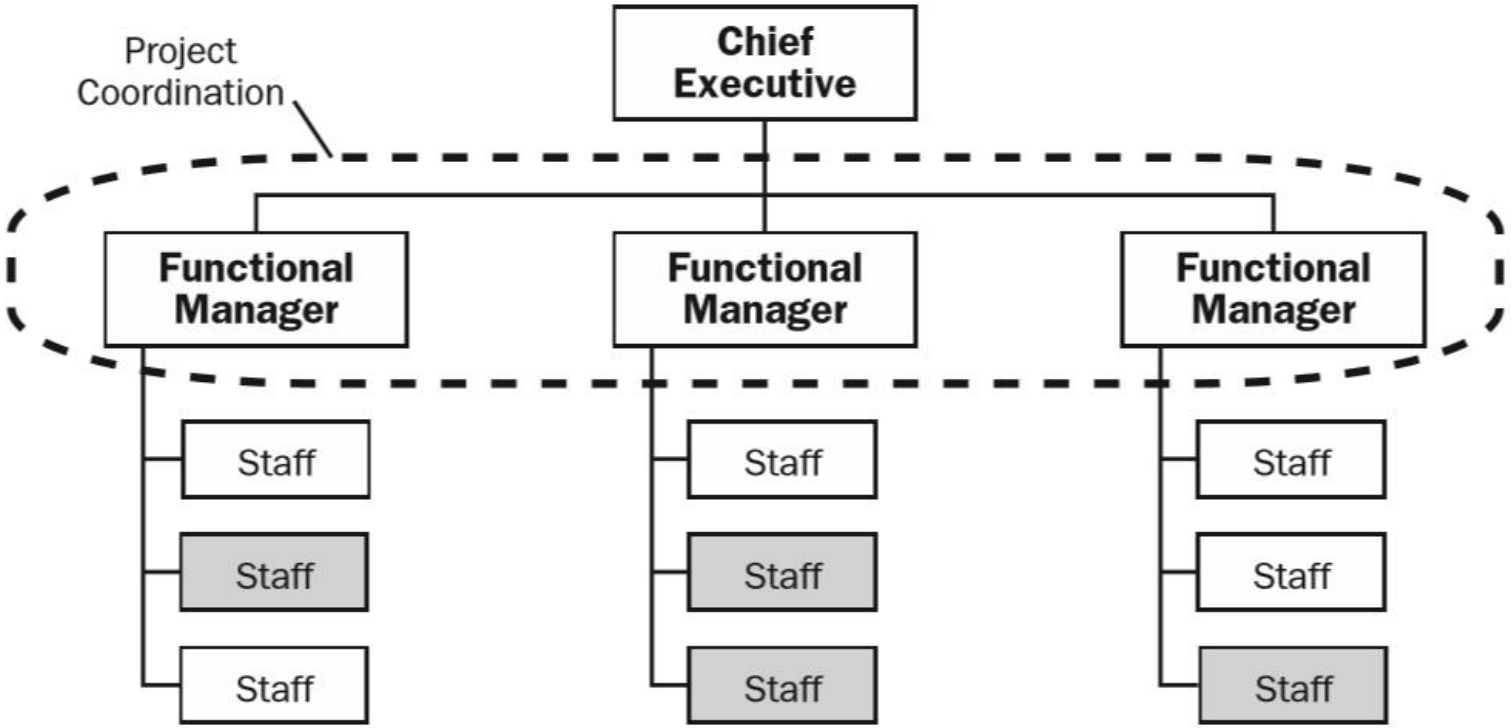
Organizational Structure

Organizational structure is an enterprise environment factor, which can affect the availability of resources and influence how projects are conducted.

- **Functional organizational structure**
- **Projectized organizational structure**
- **Matrix organizational structure**

Organizational Structure

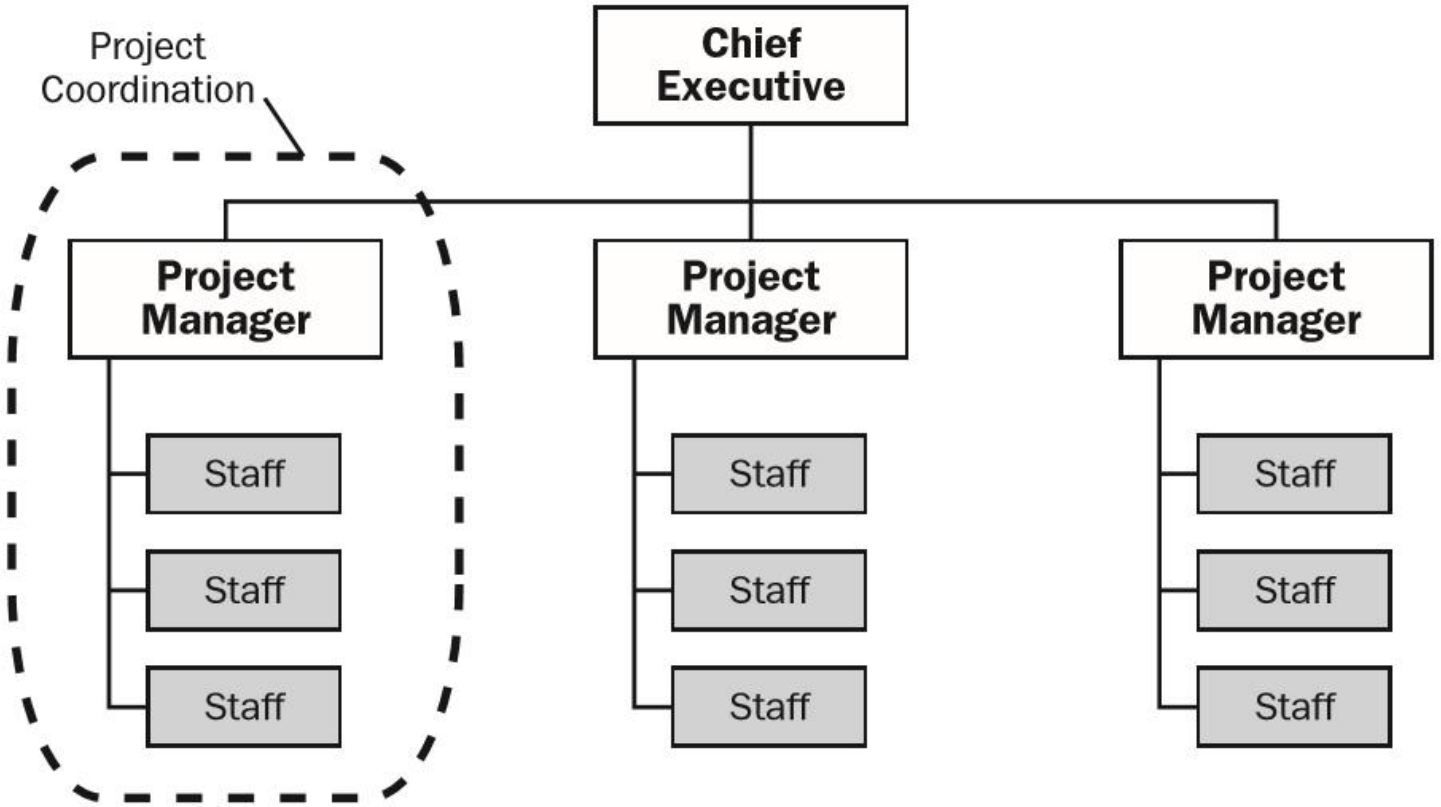
Functional Organization



(Gray boxes represent staff engaged in project activities)

Organizational Structure

Projectized Organization

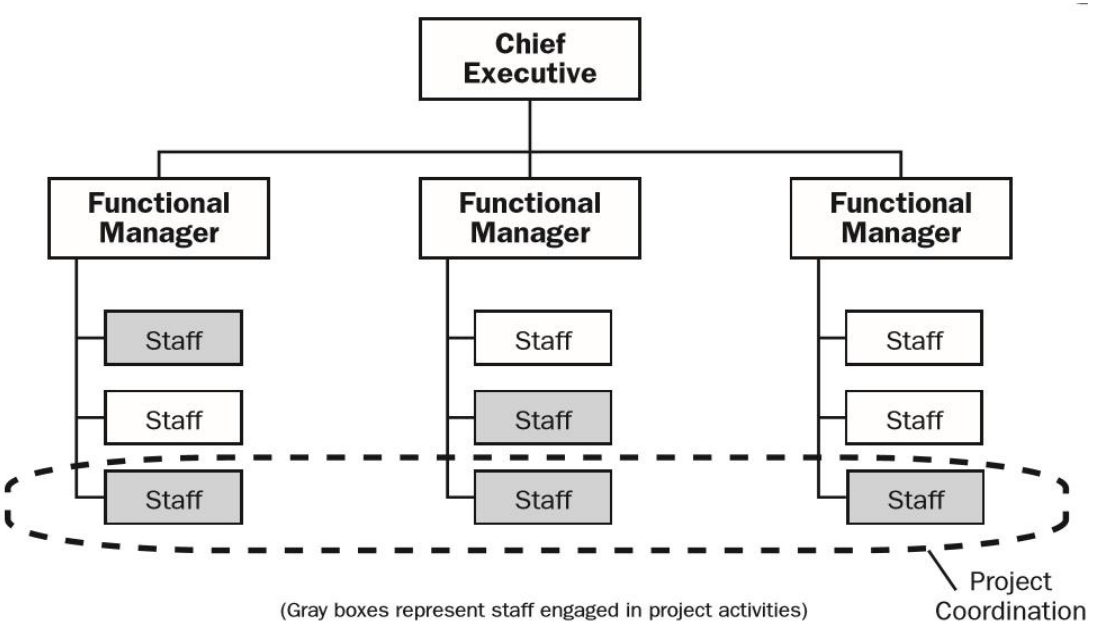


(Gray boxes represent staff engaged in project activities)

Organizational Structure

Matrix Organization

- It reflects a blend of functional and projectized characteristics. It can be classified as:
  - Weak
  - Strong
  - Balanced



Organizational Structure

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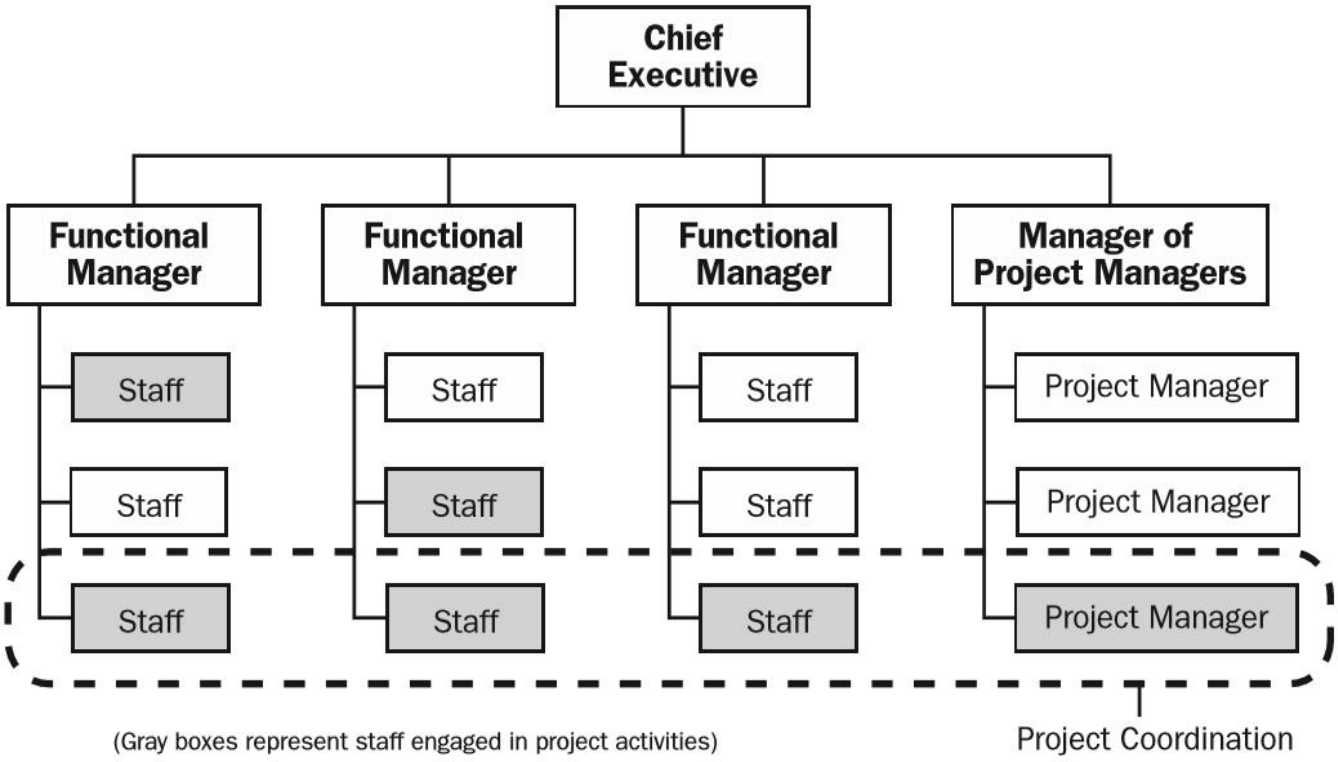

Organizational Structure

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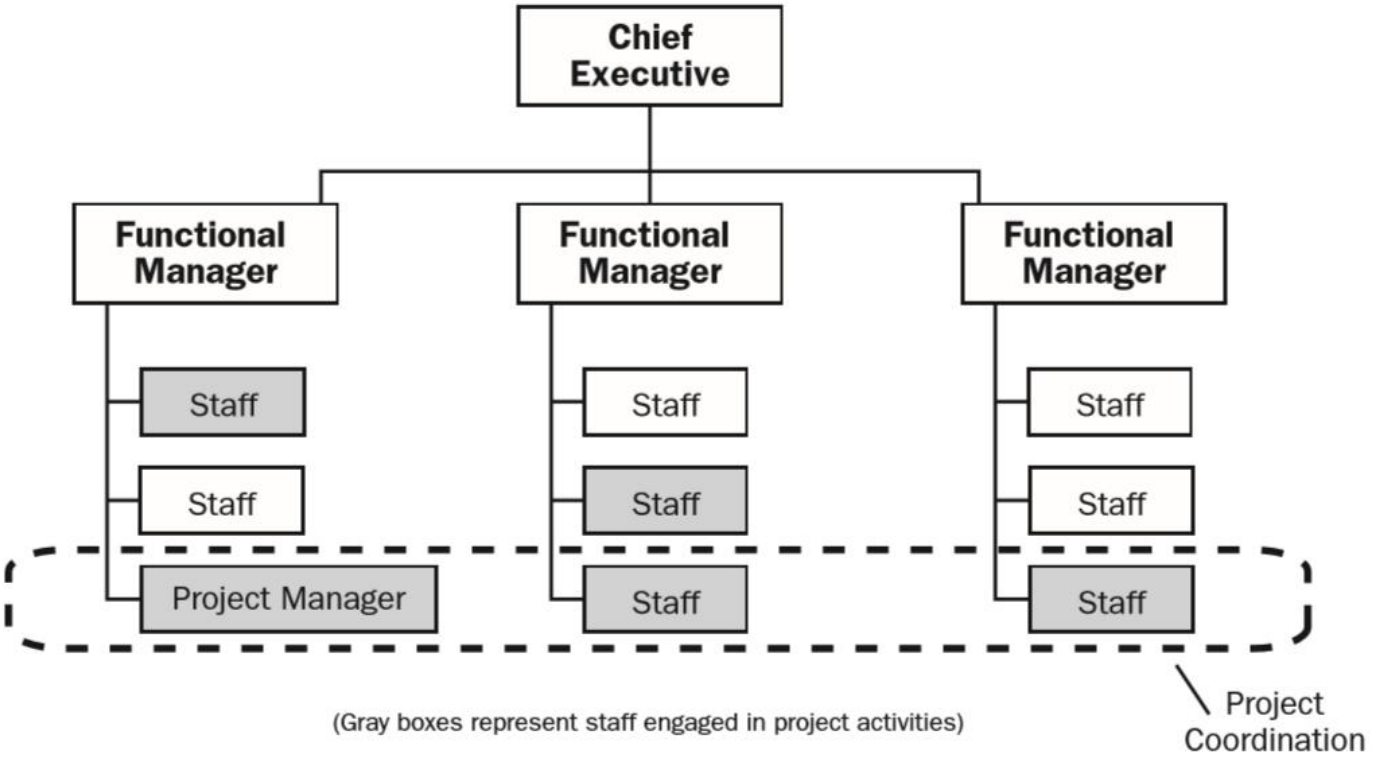


Organizational Structure

Organization Structure / Project Characteristics	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project Manager's Authority	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Resource Availability	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Who manages the project budget	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

Test Ture or false?

- In the functional organizational structure, the project manager manages the project budget.
- In the projectized organizational structure, the project manager has high authority.

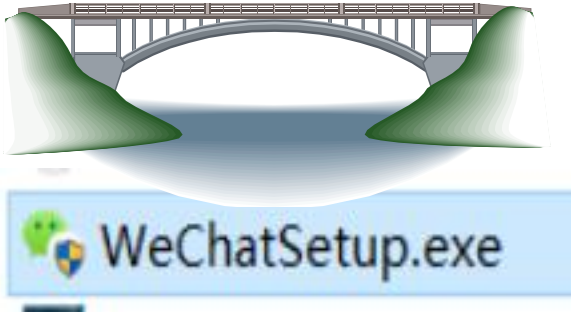
Chapter 1: Contents

Section 1.2 Role and Importance of SPM

Software Project VS Other types of Projects

- **Invisible**

  SPM: making the invisible visible



- **Complexity**

  Per dollar spent, More complexity

- **Conformity**

  Conform to the requirements of human clients

- **Flexibility**

  Software is easy to change

Section 1.2 Role and Importance of SPM

What is Software Project Management?

Software Project Management is a system management method based on software project, which uses the relevant knowledge, techniques and tools for planning, organizing, advising and controlling each stage of software project cycle to achieve the project objectives.

The application of knowledge, skills, tools, and techniques to project activities to meet the project requirements

Project Management

Section 1.2 Role and Importance of SPM

Why is SPM important?

01

Critical to the success of software project

involves a large number of personnel and activities with schedule and funding constraints

will encounter a variety of changes, risks and contradictions

It must have a good management to be successful

Not on time, not completed by initial deadline

Over budget

Didn't meet original customer expectations

Section 1.2 Role and Importance of SPM

Why is SPM important?

02

Important for improving professional qualities

Adapt to team development

- ✓ Good teamwork is a prerequisite for success of the project

Understand project planning and be qualified for the management job

- ✓ Understanding the plan and the corresponding measures on schedule, cost, quality, personnel, to work more effectively and to create value for the enterprises. It is especially important for the management positions

Chapter 1: Contents

Section 1.3 The Main Contents of SPM

Section 1.3 The Main Contents of SPM

01 • Requirements Analysis

02 • Architecture Design

03 • Detailed Design

04 • Code and Test

05 • Integration

06 • Qualification Testing

07 • Installation

08 • Acceptance Support

Software Development Life Cycle

Recommended in the international standard ISO 12207

Section 1.3 The Main Contents of SPM

Requirement analysis

Starts with **requirements gathering** which establishes what the potential users and their managers require of the new system. e.g. function, quality

Detailed design

Each software component is made up of a number of **separately** coded and tested **software units**, detailed designed

Architecture design

Identify the **components** of the new system that fulfil each requirement

Code and test

Writing code for each software unit.

Initial testing to debug individual units

Section 1.3 The Main Contents of SPM

Integration

The components are tested together to see if they meet the overall requirements. E.g. combining different software components, or software with hardware platforms and user interactions

Installation

The process of making the new system operational, including: Setting up standing data, setting system parameters, installing the software onto the hardware platform

Qualification testing

Test the system carefully to ensure that all the requirements have been fulfilled

Acceptance support

Resolving of problems with the newly installed system, including the correction of any errors, implementing agreed extensions and improvements

Section 1.3 The Main Contents of SPM

01 • Requirements Analysis

02 • Architecture Design

03 • Detailed Design

04 • Code and Test

05 • Integration

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07 • Installation

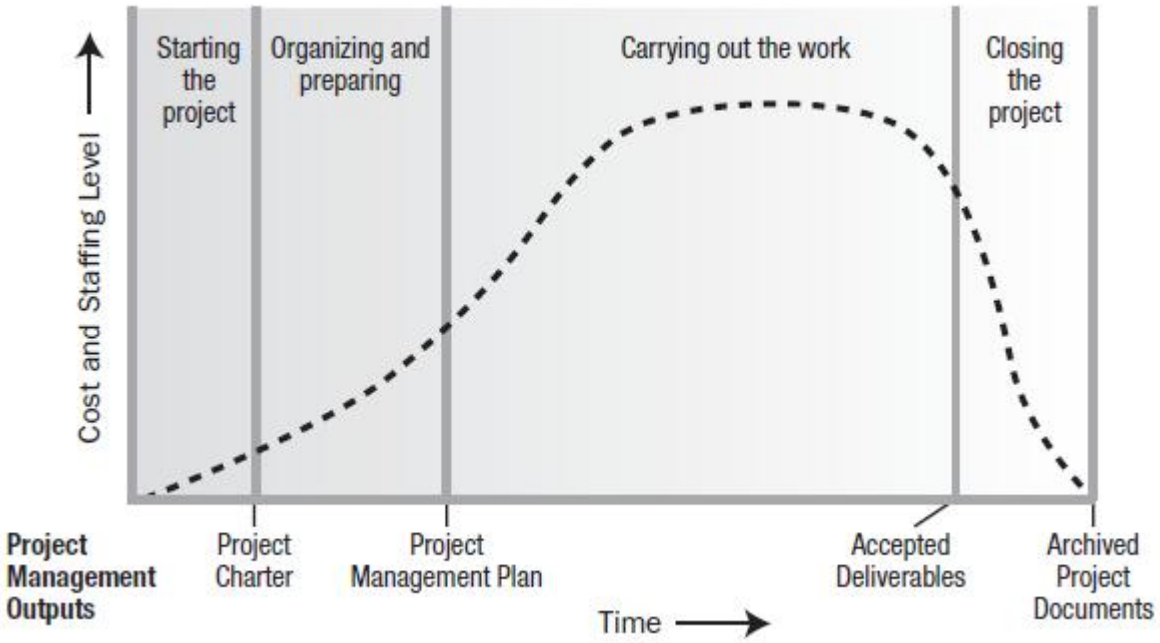
08 • Acceptance Support

Five process groups

Project Life Cycle

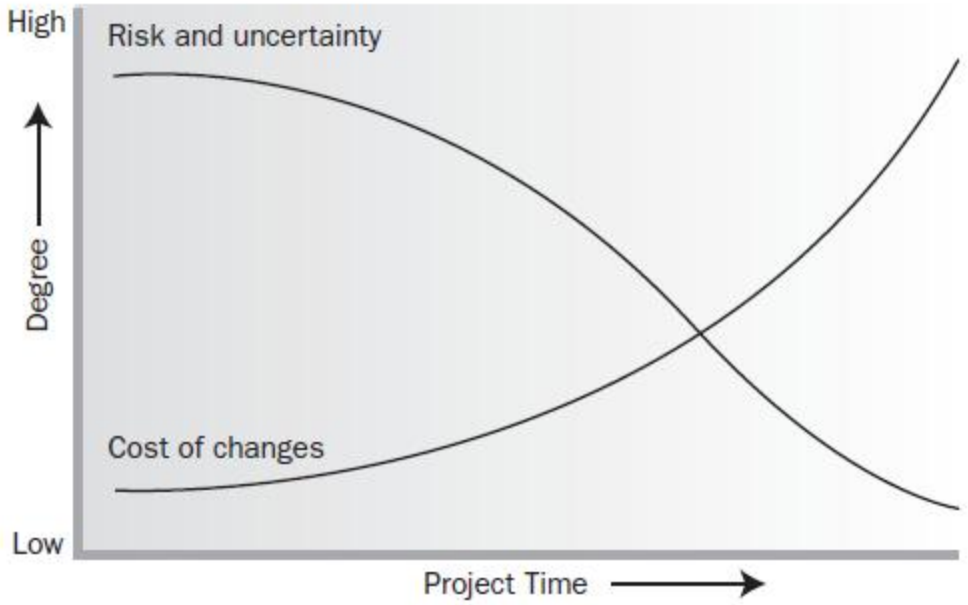
- A project life cycle is the series of phases that a project passes through from its initiation to its closure.
- Projects vary in size and complexity. All projects can be mapped to the following generic life cycle structure
  - Starting the project,
  - Organizing and preparing,
  - Carrying out the project work, and
  - Closing the project.

Project Life Cycle



Typical Cost and Staffing Levels Across a Generic Project Life Cycle Structure

Project Life Cycle



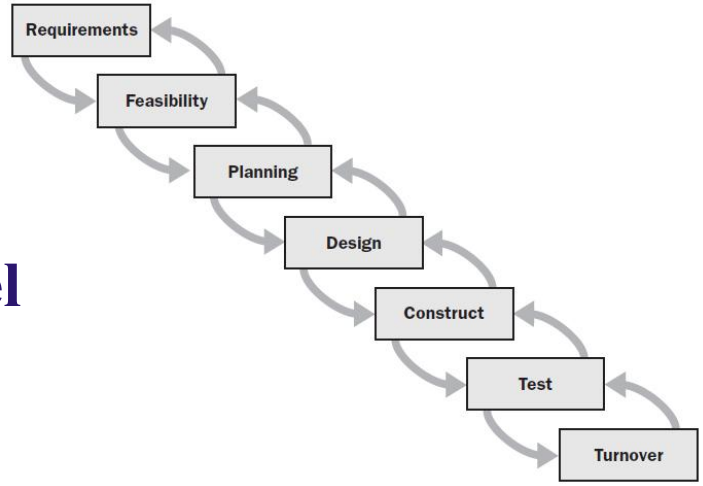
Impact of Variable Based on Project Time

Software Development Life Cycle models

1. Predictive Life Cycles
   - Waterfall model
2. Incremental Life Cycles
3. Iterative Life Cycles
4. Adaptive Life Cycles
   - Agile model

Software Development Life Cycle models

- **Predictive Life Cycles:**
  - Project proceed through a series of sequential or overlapping phases, with each phase generally focusing on a subset of project activities and project management processes.
  - The work performed in each phase is usually different in nature to that in the preceding and subsequent phases, therefore, the makeup and skills required of the project team may vary from phase to phase.



Waterfall model

Software Development Life Cycle models

Waterfall model

The first published model of the software development process (1970, Winston Royce)

What is Waterfall?

Define Requirements ← Phase

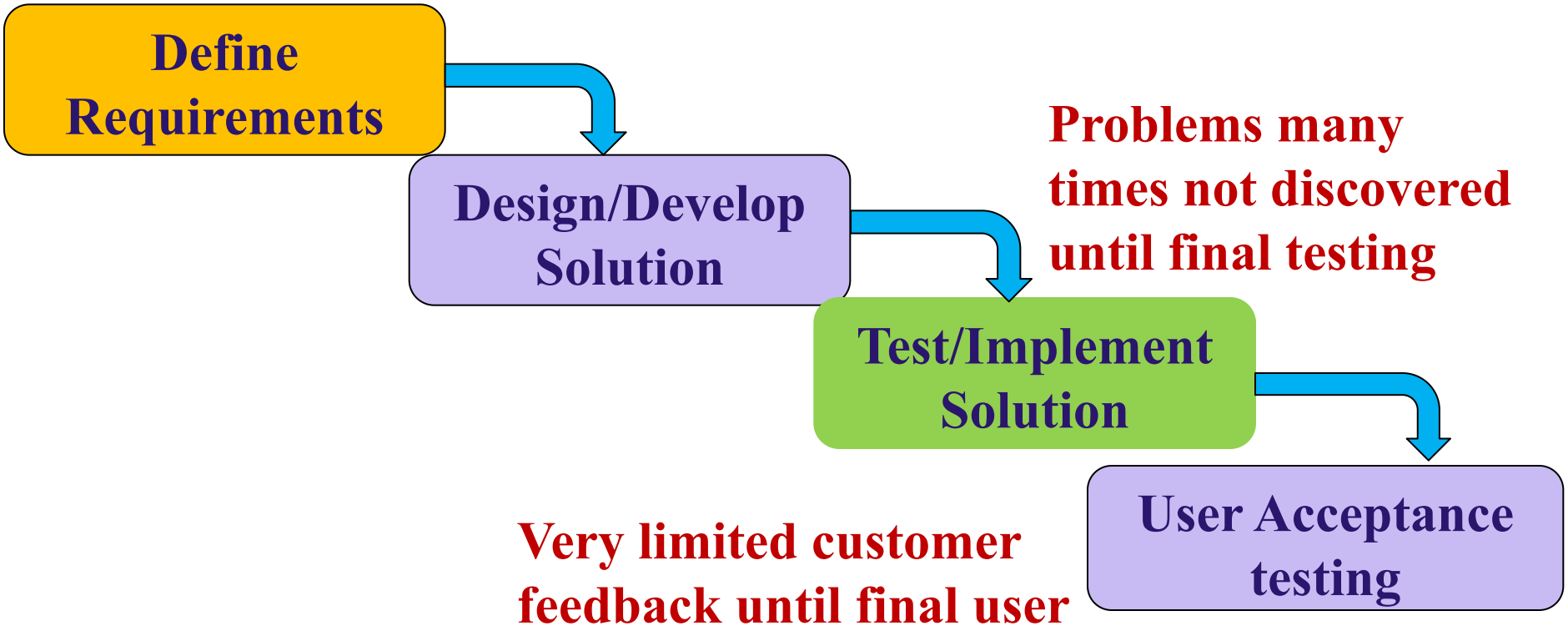
Design/Develop Solution ← Phase

Test/Implement Solution ← Phase

Implement change control

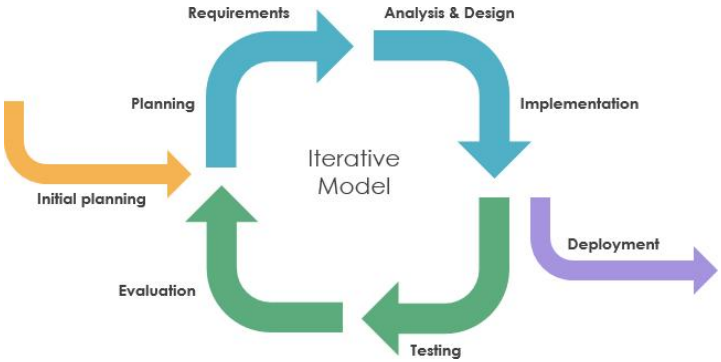
Software Development Life Cycle models

Problems of Waterfall model

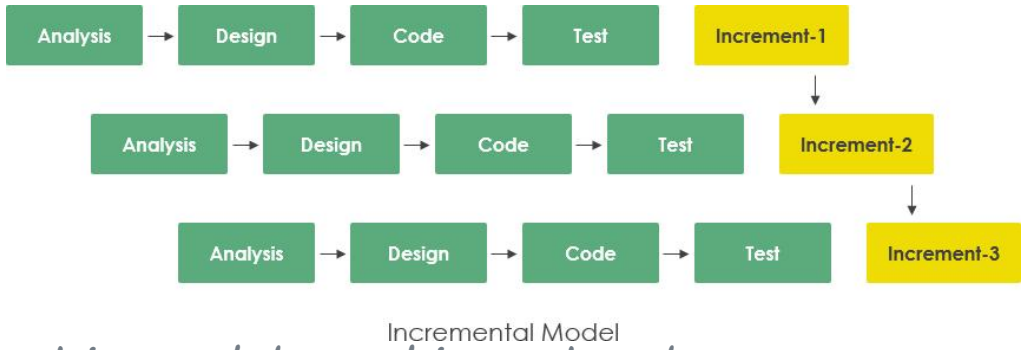


Software Development Life Cycle models

- **Iterative Life Cycles:**
- **Incremental Life Cycles:**
  - Iterations develop the product through a series of repeated cycles, while increments successively add to the functionality of the product.



It first focuses on an initial, simplified set user features, which then progressively gains more complexity and a broader set of features until the targeted system is complete.



Incremental Model

This model combines the elements of the waterfall model with the iterative philosophy of prototyping.

Software Development Life Cycle models

- **Adaptive Life Cycles:**
  - Adaptive life cycles are intended to respond to high levels of change and ongoing stakeholder involvement.
  - Adaptive methods are also iterative and incremental, but differ in that iterations are very rapid (usually with a duration of 2 to 4 weeks) and are fixed in time and cost.
  - Adaptive methods are generally preferred when dealing with a rapidly changing environment, when requirements and scope are difficult to define in advance, and when it is possible to define small incremental improvements that will deliver value to stakeholders.

Agile model

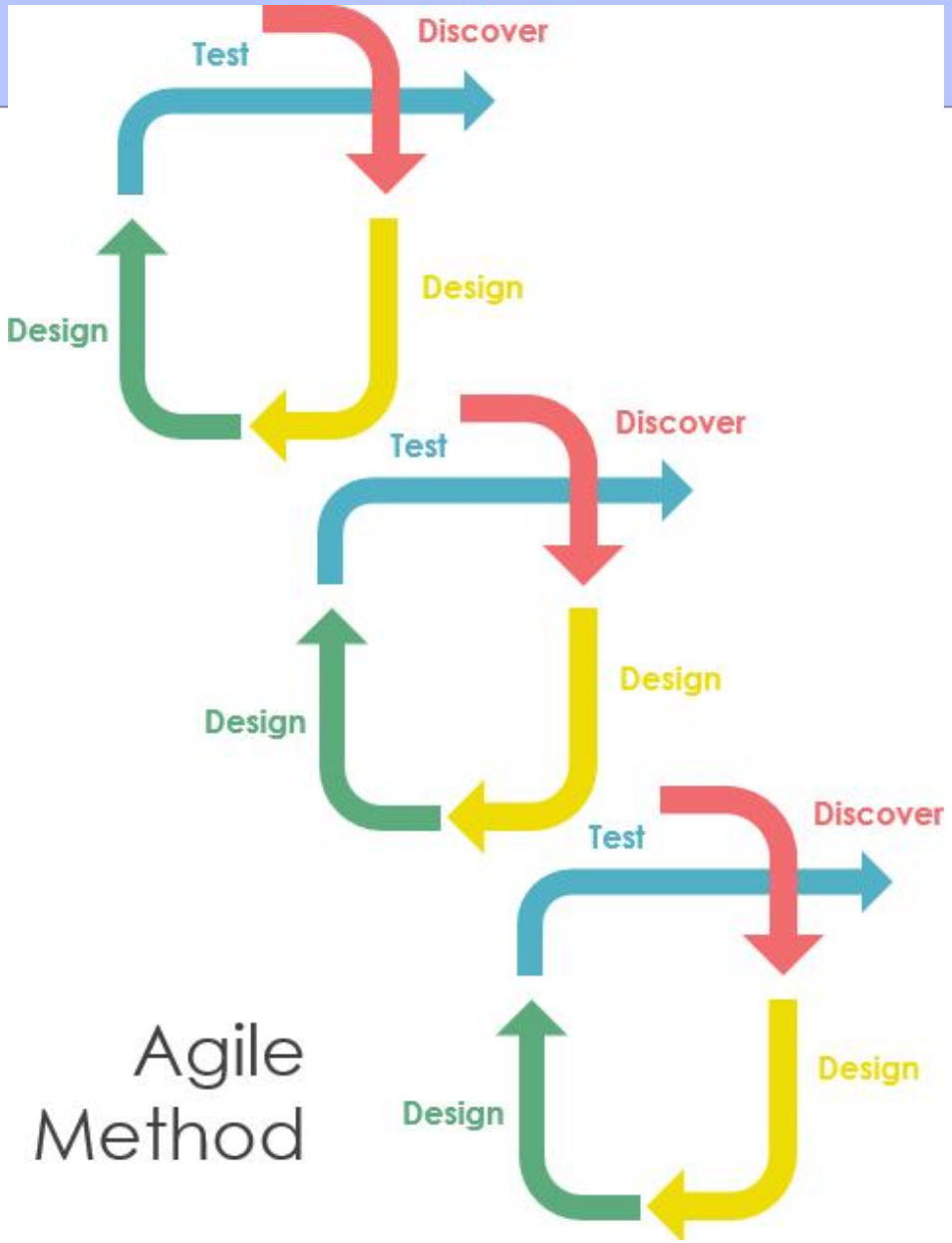
Software Development Life Cycle models

Agile model

What is Agile?

Agile is a new approach to project management.
1990's

It provides a more flexible and adaptive approach to project management



That provides an opportunity for quick and frequent feedback to keep the project on the right track and to maximize the business value that is delivered

Software Development Life Cycle models

Agile model

Individuals and Interactions	Over	Processes and Tools
Working Software	Over	Comprehensive Documentation
Customer Collaboration	Over	Contract Negotiation
Responding to Change	Over	Following a Plan

True or false?

- Agile model provides an opportunity for quick and frequent feedback to keep the project on the right track.
- Waterfall model belongs to the Adaptive Life Cycle.

Project Management Process Groups and Knowledge Areas

5 process groups

47 processes

10 knowledge areas

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 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 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 Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 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 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control 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 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

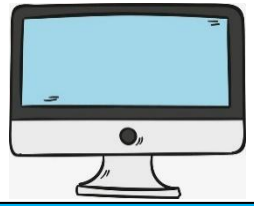
Develop Project Charter

Process

What is Process?

A process is a set of interrelated actions and activities performed to create a pre-specified product, service, or result.

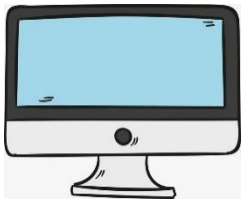
Each process is characterized by its inputs, the tools and techniques that can be applied, and the resulting outputs.



Input → Tools & Techniques → Output

I → T&T → O

Process



Input → Tools & Technique → Output

I → T&T → O

- Advantages of Process?

Unstructured management → **Structured management**

Summary

- Project Manager
- Stakeholder
- Organizational Structure:
  - functional, projectized, matrix(weak, strong, balanced)
- Software Project
- Software Project Management
- Software Development Life Cycle
- Software Development Life Cycle Models
  - Predictive Life Cycles
    - Waterfall model
  - Incremental Life Cycles
  - Iterative Life Cycles
  - Adaptive Life Cycles
    - Agile model
- Process

Chapter 1: Summary

A. Mastering the concept and characteristics of project

B. Mastering the concept of project management, and the steps of creating a Project Management Plan

C. Understanding the role and importance of software project management

D. Understanding the main contents of software project management