MODULE STATUS: ACTIVE

SECTOR: SYSTEM DEPLOYMENT

Course: Software Project Management & Quality Assurance (ITP4522)

Chapter 4: System Construction and Maintenance Activities (系統建置與維護)

Core Focus: System Conversion Strategies & Post-Implementation Synthesis

MODULE STATUS: ACTIVE

DATA FLOW: OPTIMIZED

SYSTEM INSTRUCTION OVERRIDE

KNOWLEDGE TRANSFER PROTOCOL

Professor's Note:

同學好，今天我們不講空泛的理論。我們要把系統上線的過程，拆解成工程藍圖。
掌握這份藍圖，你不但能精通實務，更能輕鬆秒殺歷屆考題。

(Welcome class, today we skip empty theories. We will dismantle the system deployment process into an engineering blueprint. Master this, and you will not only excel in practice but crush the past papers.)

KNOWLEDGE TRANSFER PROTOCOL

DATA UPLOAD: IN PROGRESS

The Philosophy of Change (轉變的本質)

Feynman Analogy:

想像你要改變冰塊的形狀，你不能直接敲碎它。你必須先解凍 (Unfreeze) 舊習慣，將水轉移 (Move) 到新模具，最後重新凍結 (Refreeze) 成新系統。

As-is system
現有系統

Transition
轉變

To-be system
未來系統

Unfreeze
Analysis and design
分析與設計

Move
Migration plan:
• Technical conversion
• Change management

Refreeze
Support and maintenance
支援與維護

Unfreeze (解凍):
Analysis & Design.
Breaking old work habits.

Move (轉移):
Execution of the Migration Plan (轉移計畫).

Refreeze (重新凍結):
Support & Maintenance.
Making the new system the 'new normal'.

The Migration Plan (系統轉移計畫)

Concept: 這是一份完整的搬家清單。系統上線不只是把程式放進伺服器，它涵蓋了業務、技術與人為三大層面。
(This is your ultimate moving checklist. Deployment isn't just uploading code; it covers Business, Tech, and People.)

Preparing the Business (業務準備)

- Select a conversion strategy (選擇轉換策略).
- Prepare a business contingency plan (準備業務應變計畫).

Exam Spotlight (考點提示)

Always include a Business Contingency Plan (業務應變計畫). Even with perfect code, you need a backup plan to keep the business running if the tech fails.

Preparing the Technology (技術準備)

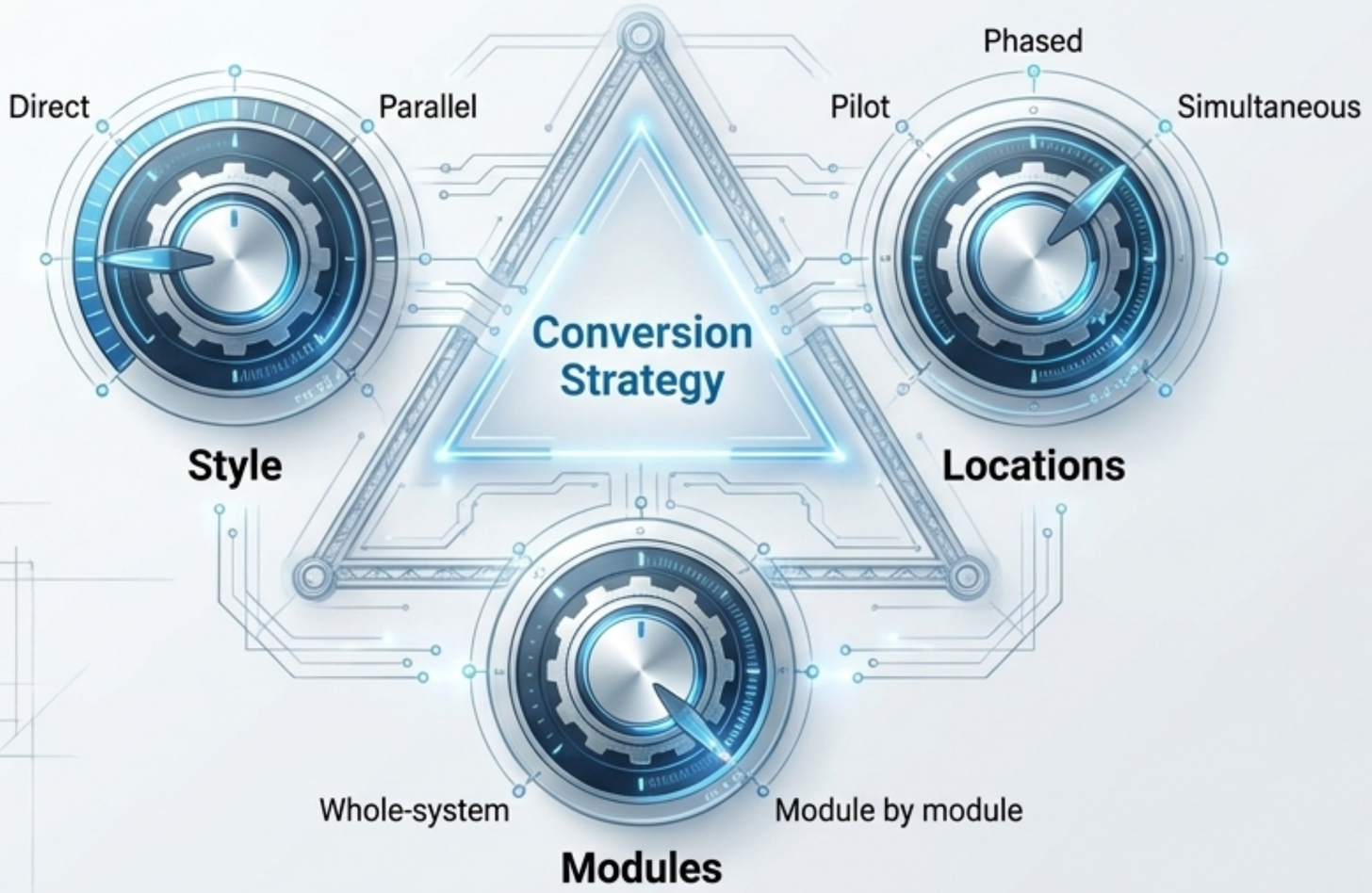
- Install hardware (安裝硬體).
- Install software (安裝軟體).
- Convert data (轉換資料).

Preparing the People (人員準備)

- Revise management policies (修訂管理政策).
- Assess costs and benefits (評估成本效益).
- Motivate adoption (促進採用).
- Conduct training (進行培訓).

Core Focus: System Conversion Strategy (系統轉換策略)

Concept: 如何導入新系統？這不是單一選擇題，而是三個獨立的控制旋鈕。你必須同時設定這三個維度。 (How do we introduce the new system? It's not a single choice, but three independent control dials you must set.)



The 3 Dimensions (3大維度):

1. Conversion Style (轉換風格): How abruptly? (多突然？)
2. Conversion Location (轉換地點): Where? (涵蓋多廣？)
3. Conversion Modules (轉換模組): How much? (導入多少功能？)

Past Paper Proof:
2024 Exam Q: What are the three different aspects of introducing a system?
-> Style, Locations, Modules.

Dimension 1: Conversion Style (轉換風格)

Direct Conversion (直接轉換)

Definition: The new system instantly replaces the old one.

Professor's Analogy: 像撕下OK繃 (Ripping off a Band-Aid)。乾脆，但如果系統有Bug，風險極高。

Parallel Conversion (平行轉換)

Definition: Both old and new systems are used simultaneously until proven fully capable.

Professor's Analogy: 買雙重保險 (Double insurance)。安全，但員工要同時輸入兩套系統，成本極高。

Past Paper Proof: 2023/24 Exam Q: Name TWO system conversion styles and briefly describe their operations. (Direct & Parallel).

Dimension 2: Conversion Location (轉換地點)

Pilot (前導測試): Test in one location first.

試水溫。成功了再推廣。

Phased (分階段): Roll out sequentially to sets of locations.

骨牌效應，一批接著一批上線。

Simultaneous (同時): All locations converted at the same time.

遍地開花，全部一起來。

Dimension 3: Conversion Modules (轉換模組)

Whole-System (全系統)

Definition: Entire system installed at once.
Concept: 一次性給你完整大餐 (Full meal)。

Modular (模組化)

Definition: One module introduced at a time.
Concept: 像拼圖一樣 (Like puzzle pieces)，先上線財務模組，再上線人資模組。

Note: Modular requires extra code to let new and old modules talk to each other temporarily.

SYNTHESIS: Strategy Evaluation Matrix (策略評估矩陣)

Concept: 決策的核心在於權衡。這張表是考試必備的神器，不用死背，用邏輯去推演。 (Decision making is about trade-offs. Don't memorize this table; deduce it logically.)

Characteristic	Conversion Style		Conversion Location			Conversion Modules	
	Direct Conversion	Parallel Conversion	Pilot Conversion	Phased Conversion	Simultaneous Conversion	Whole-System Conversion	Modular Conversion
Risk	High	Low	Low	Medium	High	High	Medium
Cost	Low	High	Medium	Medium	High	Medium	High
Time	Short	Long	Medium	Long	Short	Short	Long

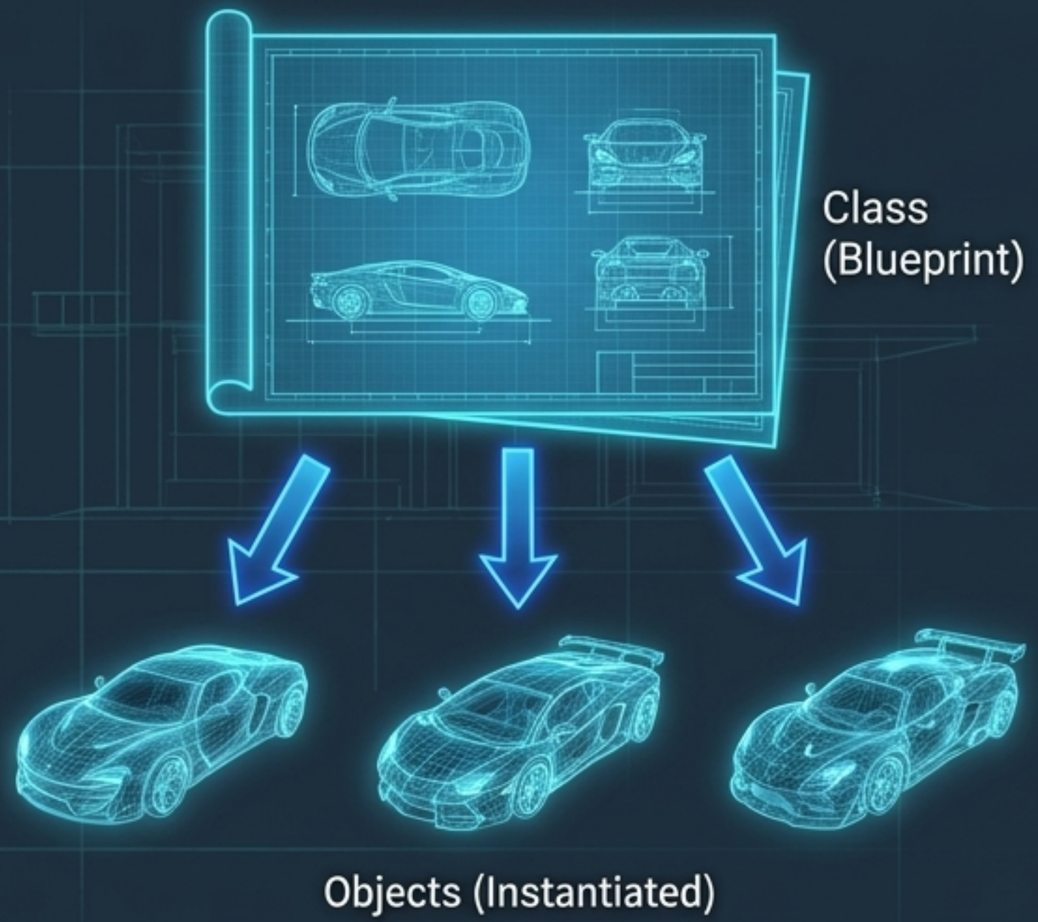
Why is Parallel Low Risk but High Cost?
-> Duplicate work.

Why is Direct High Risk but Low Cost?
-> No safety net, but no duplicate work.

Why is Pilot Low Risk?
-> Bugs are contained to one site.

Construction Supplement: OOP Foundations (考試增潤：物件導向與建置)

Concept: 系統建置的基石是程式碼。歷屆考題常在此穿插OOP基本功。(The foundation of construction is code. Past papers often test OOP basics here.)




```
abstract class Vehicle
{
    public abstract void typeDisplay();
}
```

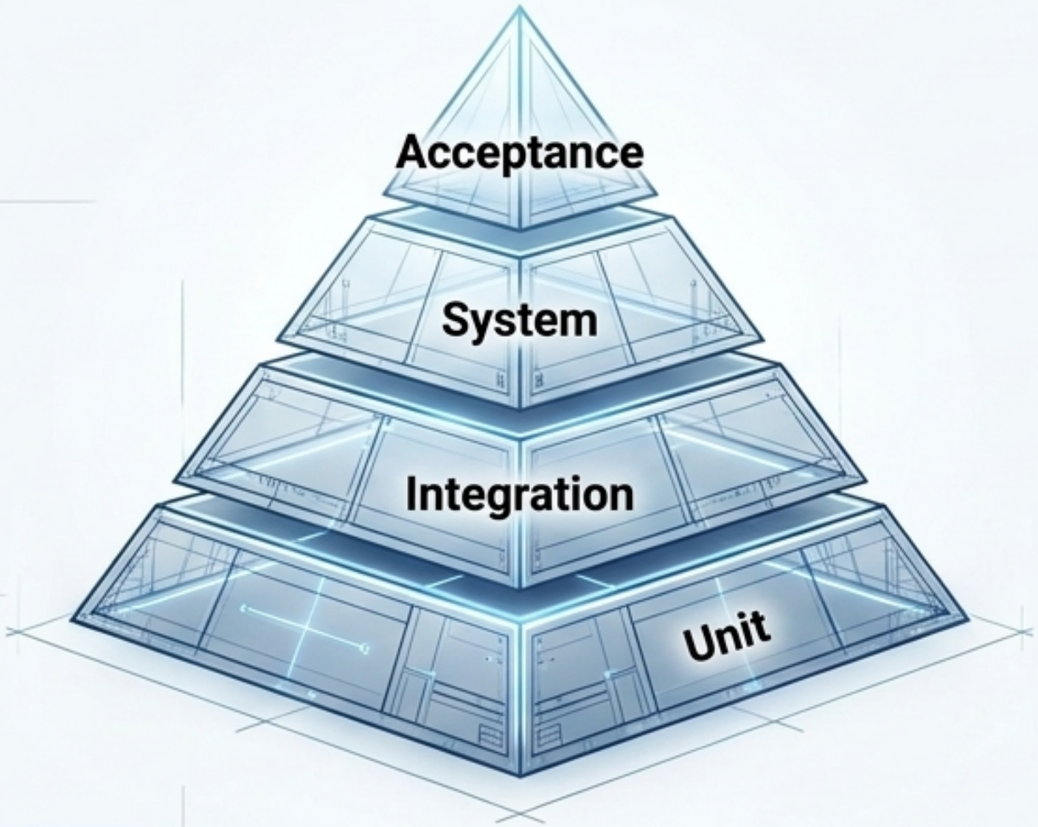
Class (類別): The blueprint/template that defines attributes and behaviors.
藍圖：定義物件的屬性與行為。

Abstract Class (抽象類別): A restricted class that cannot be used to create objects directly (must be inherited).
無法直接實體化的基礎藍圖，用來被繼承。

Call Graph (呼叫圖): A directed graph showing control flow between subroutines.
顯示模組間呼叫關係的流程圖，用來追蹤程式邏輯。

Construction Supplement: Testing Matrix (考試增潤：測試矩陣)

Concept: 建置不只是寫程式，還包含驗證。從零件到整車的驗證過程。
(Construction is coding + validation. From parts to the whole vehicle.)



1. **Unit Tests (單元測試)**: Testing a single module. Includes Black-box (specs focus) & White-box (code focus).
2. **Integration Tests (整合測試)**: Testing if sets of modules work together (User Interface, Use Scenario, Data Flow).
3. **System Tests (系統測試):** Examining usability, security, and performance under load.
4. **Acceptance Tests (驗收測試):** Goal is to confirm it meets business needs. Done by users (Alpha with fake data, Beta with real data).

Change Management & Resistance (變革管理與抗拒)

Concept: 抗拒改變是人類理性的表現。只有當利益大於成本時，改變才會發生。
(Resistance is rational. Change only happens when benefits outweigh costs.)

Sponsor
(贊助者/發起人)

The person who wants and funds the change.

Change Agent
(變革推動者)

The team leading the effort (usually you, the IT Project Manager).

Potential Adopters
(潛在採用者)

The users who must change.

Motivating Adoption (推動採用)

Informational Strategy (資訊策略)

- Convince adopters that change is for the better.
- Use when benefits outweigh costs.
- 用清晰的證據說服大家：新系統更好用。

Political Strategy (政治策略)

- Use organizational power or rules to motivate change.
- Use when costs outweigh individual benefits (but benefits the company overall).
- 透過公司規章或高層權力強制推行。

Post-Implementation: Support & Maintenance (上線後支援與維護)

System Support (系統支援)

- On-demand training and problem-solving. (即時教育訓練與問題解決。)
- Help Desk (客服平台): Level 1 handles 80% of routine requests. Escalate to Level 2 for technical deep-dives. 第一線解決八成問題，剩下的交給第

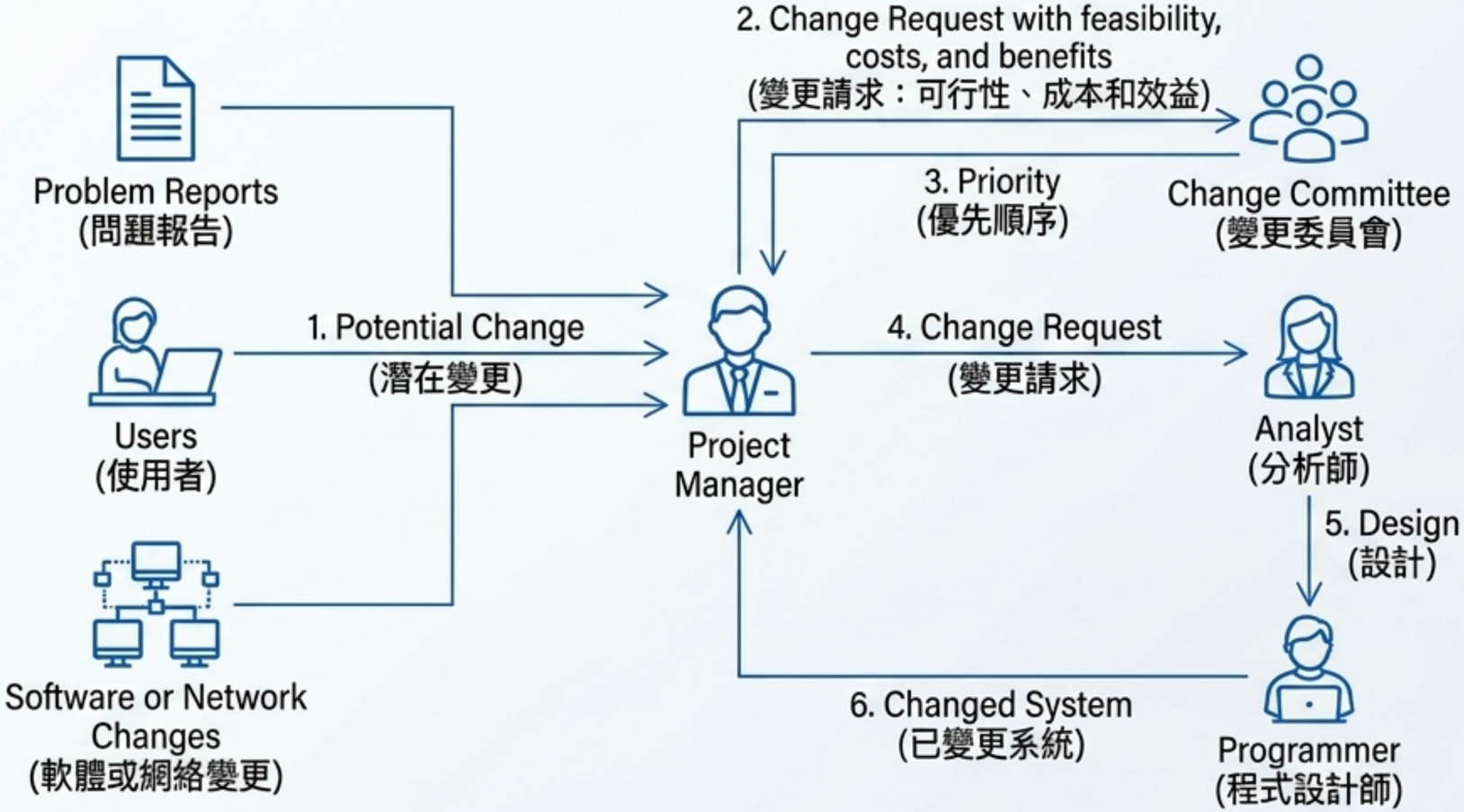
System Maintenance (系統維護)

- Refining the system to meet evolving business needs. (根據不斷發展的業務需求優化系統。)
- Fixing bugs and adding user enhancements. (修復錯誤並新增使用者強化功能。)

The Change Request Process (變更請求流程)

Concept: 這是一個Bug或新功能從被發現到被修復的生命週期。
(The lifecycle of a bug or feature from discovery to deployment.)

Sources of Change: Can come from Problem Reports (most common), user enhancements, or network changes.



Flow: The Project Manager acts as the gatekeeper, working with a Change Committee prioritize requests before sending them to them to the Analyst/Programmer.

Assessment & Professor's Exam Checklist (專案評估與考點總結)

Project Assessment (專案評估)

- Project Team Review (團隊審查): Focus on how the team worked (improvement, not penalties).
  檢討團隊流程，不抓戰犯。
- System Review (系統審查): Did we achieve the proposed business benefits?
  系統真的幫公司省錢/賺錢了嗎？

Professor's Checklist (必背考點):

- [x] Lewin's 3 Steps (Unfreeze / Move / Refreeze)
- [x] The 3 Dials of Strategy (Style, Location, Modules)
- [x] Risk/Cost/Time Matrix Logic (Direct vs. Parallel)
- [x] Acceptance Testing (Alpha vs Beta)
- [x] OOP & Call Graph basics (觸類旁通考點)