

*Software Analysis and Design  
Using UML*

IBM UML Resource Center

<http://www.omg.org/uml/>

Systems Analysis and Design with UML : An Object-Oriented Approach , Second Edition, Alan Dennis

Object-Oriented Software Engineering: Using UML, Patterns and Java, Second Edition, Bernd Bruegge

系統分析與設計—理論與實務應用, 吳仁和

系統分析教材, 劉志俊教授

TBLink 技轉資料

# 相關主題

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- UML
- OOP
- OOAD
- Design pattern
- Software Engineering
- CMMI

## What is Rational Unified Process (RUP)?

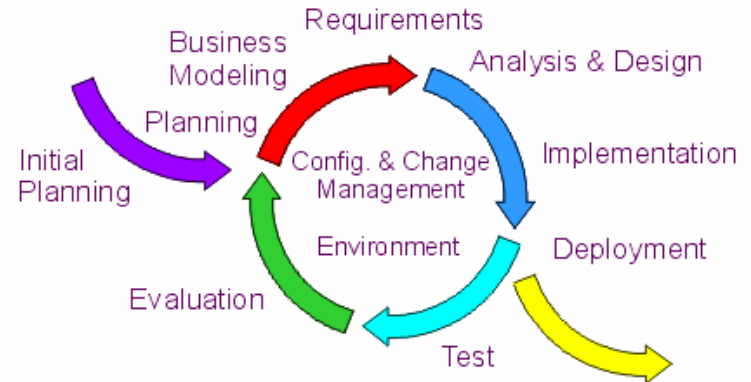
*A generic software development process framework that can be specialized*

*Component-based*

*Use-case driven*

*Architecture centric*

*Iterative and incremental*



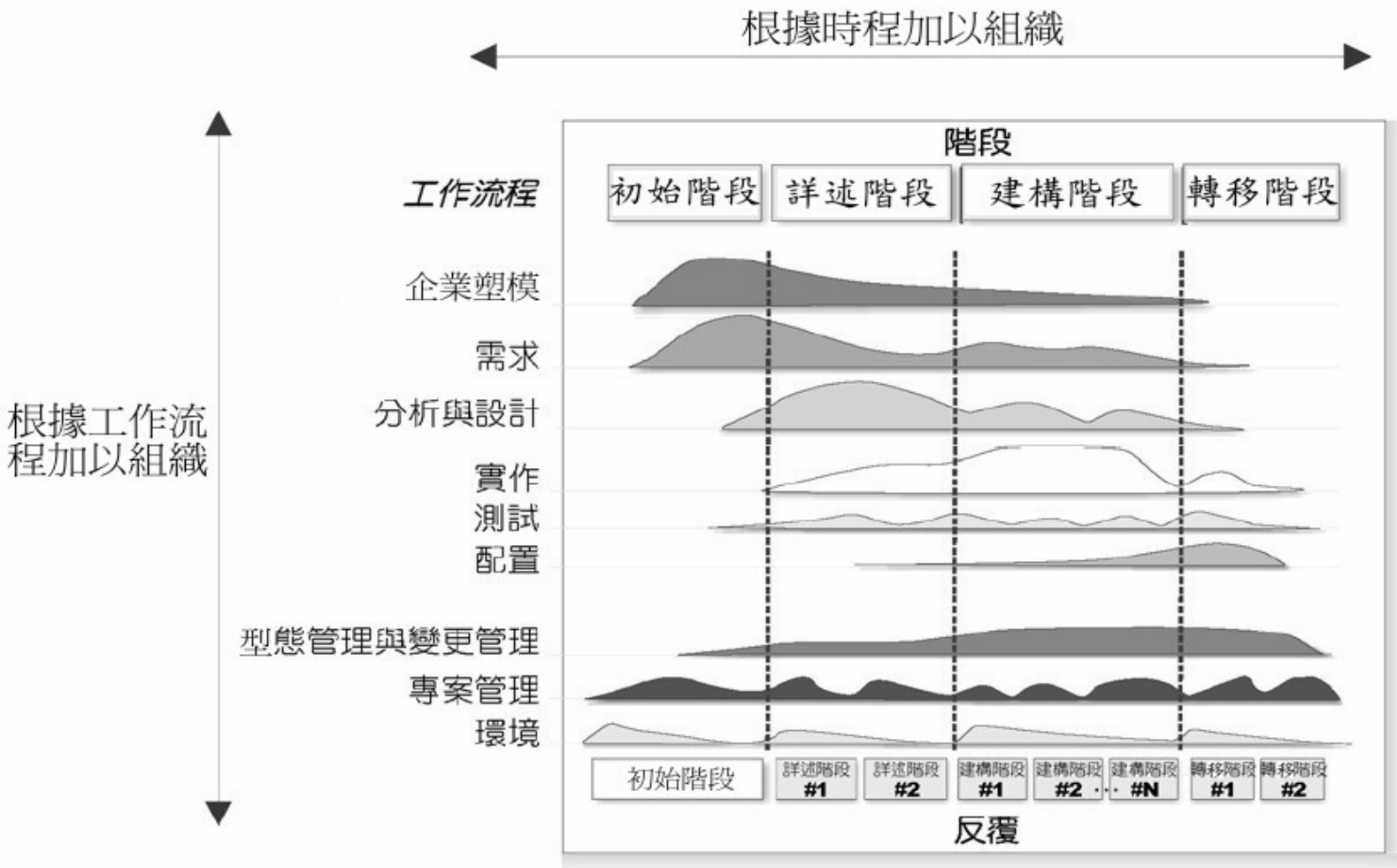
## RUP – a Rational Product

*Web-enabled software engineering process*

*Providing extensive guidelines, templates, and examples*

*Tightly integrated with Rational tools, the Unified Modeling Language (UML), and other industry best practices*

# RUP模式的構面



# RUP 模式生命週期 階段、目標與里程碑

## □ 初始階段

目標：

- 瞭解專案範圍
- 建立企業個案
- 取得有關人員對推展該專案的認同

里程碑：完成專案生命週期目標

## □ 詳述階段

目標：

- 降低主要技術之風險
- 創造系統基本結構
- 瞭解用何資源以建構系統

里程碑：完成生命週期結構

## □ 建構階段

目標：

- 建構與演化可運作的系統版本

里程碑：初步可運作的系統版本（常稱為β版）

## □ 轉移階段

目標：

- 建立最終版本的軟體系統，並移交給客戶

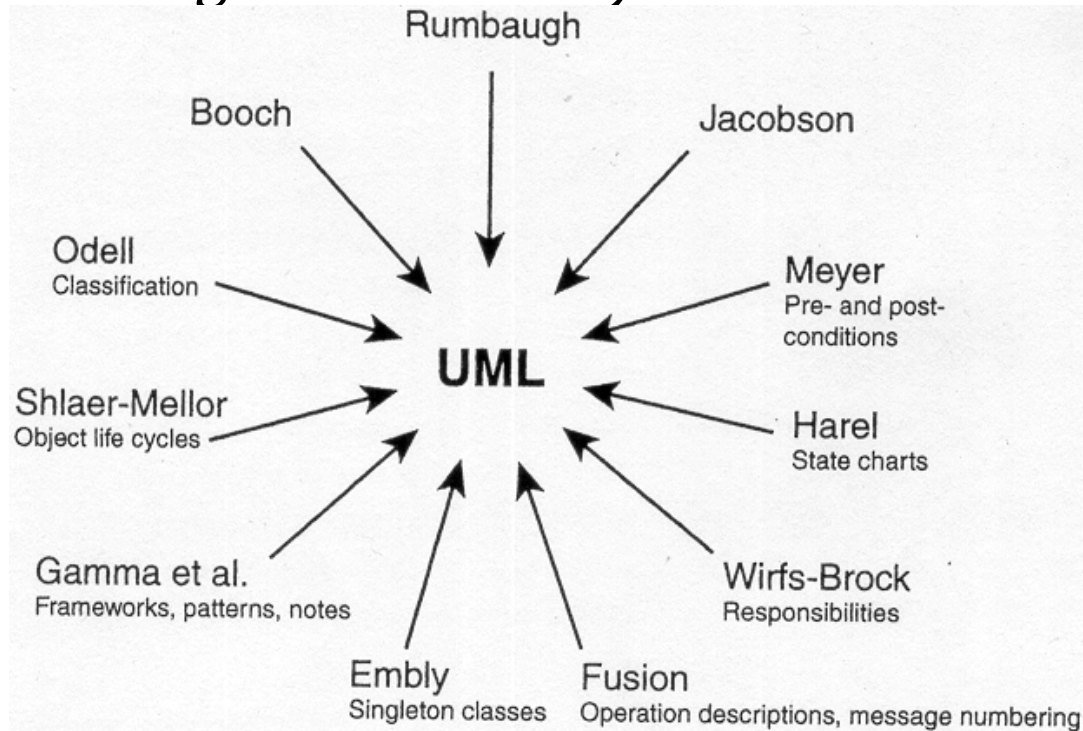
里程碑：完成軟體產品出版

# What is UML & How did it evolve?

## Unified Notation for Object-Oriented Analysis and Design

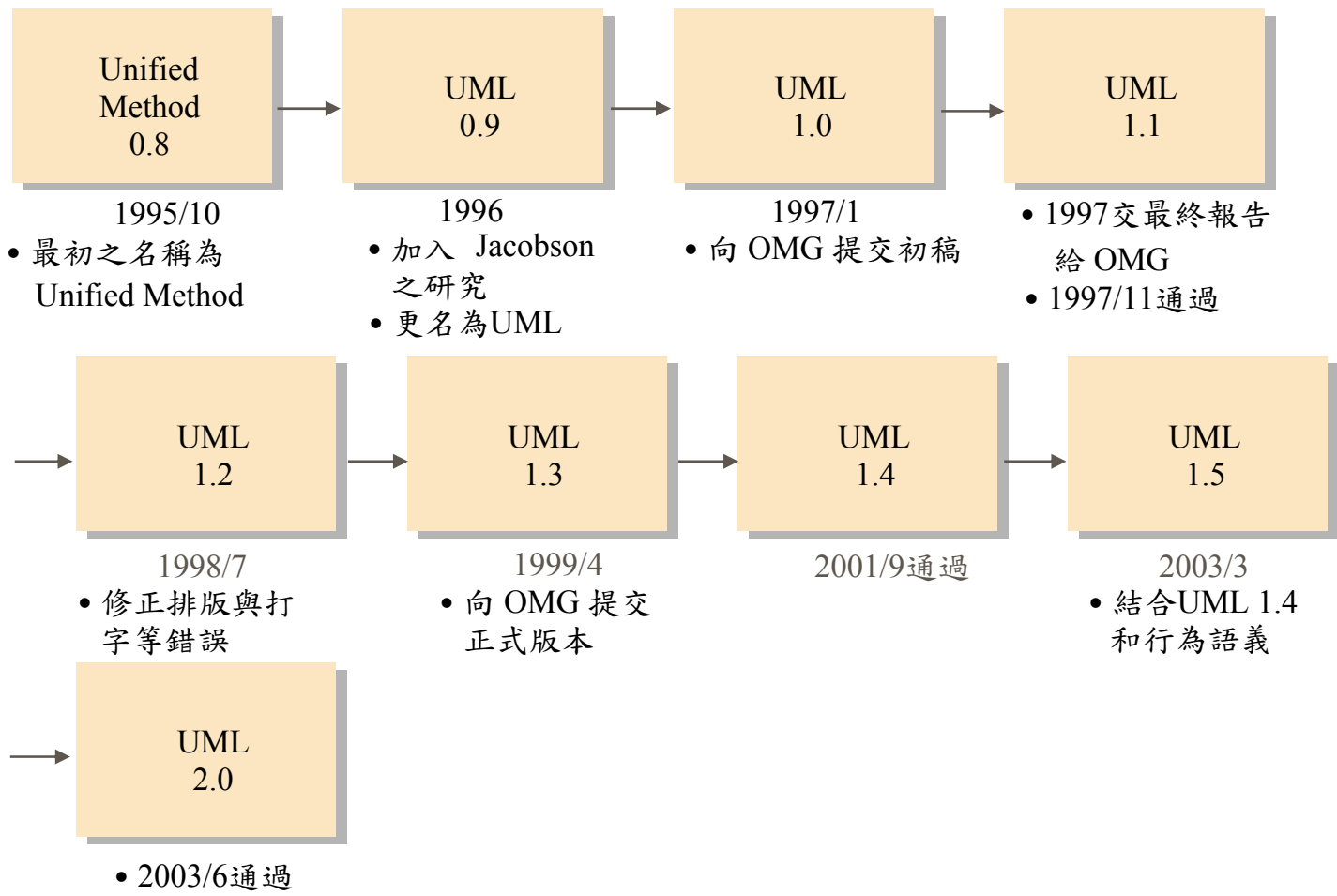
*Evolves from Booch, OMT and OOSE etc.*

*Visual modeling of software systems*

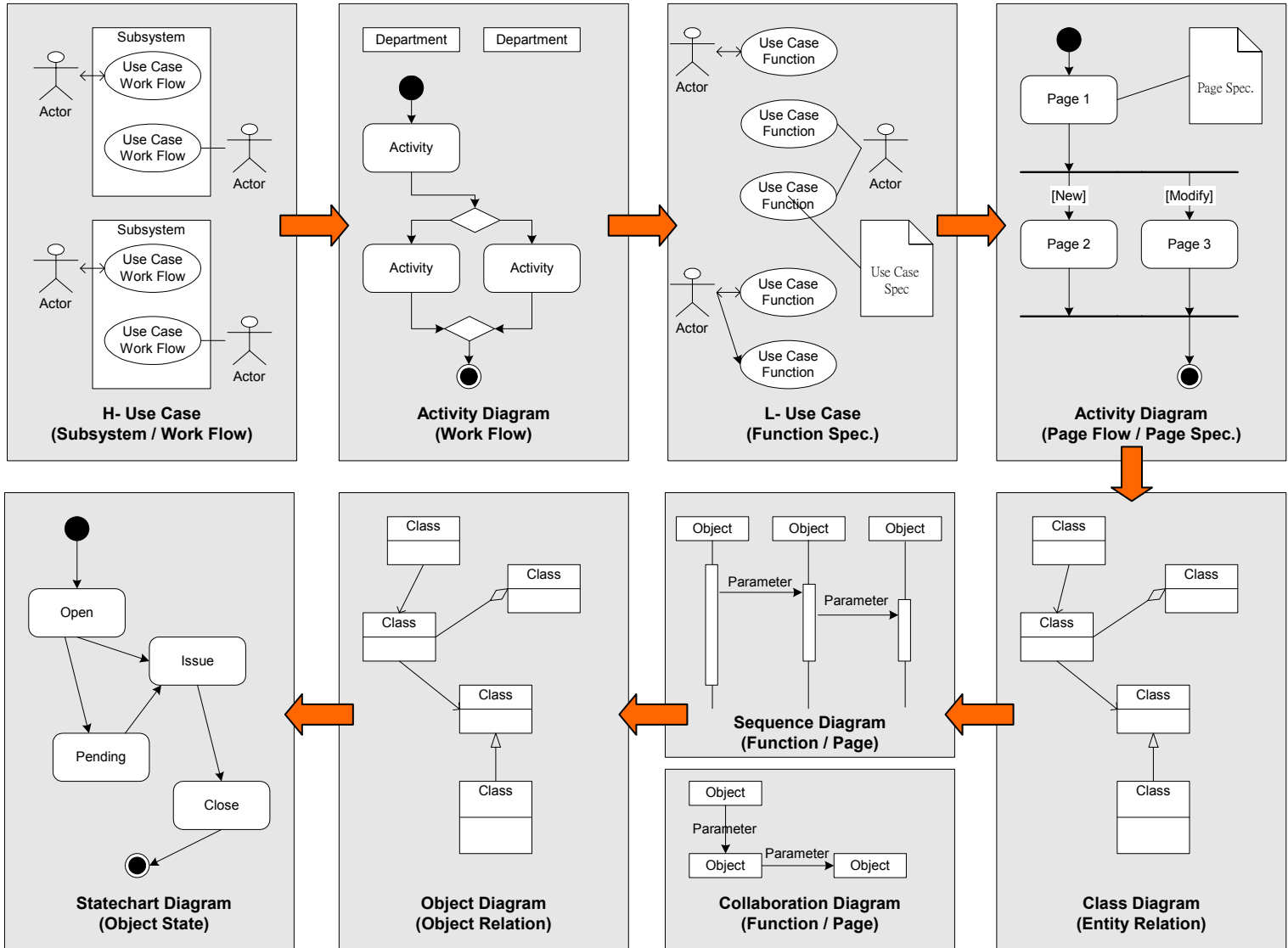




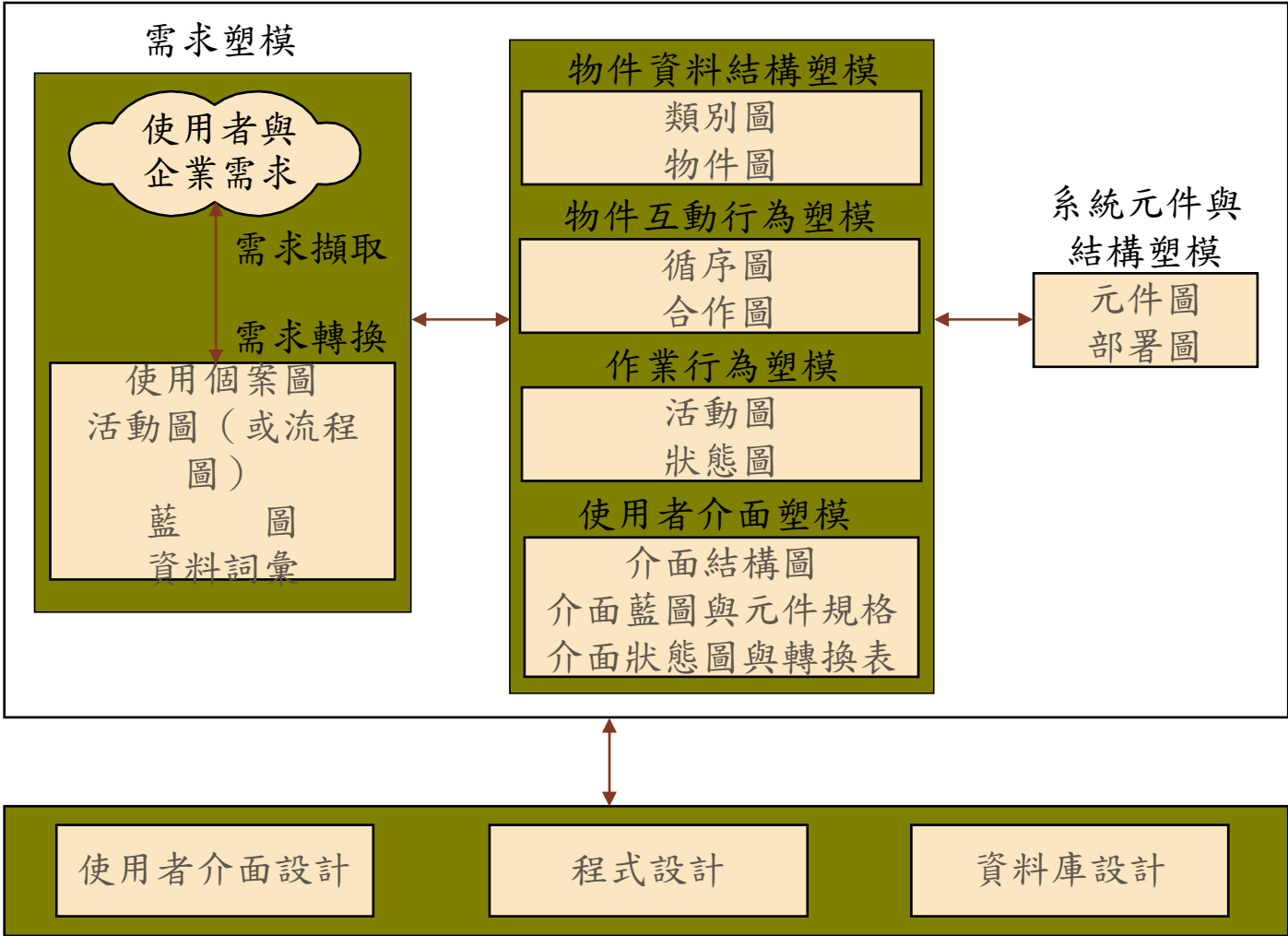
# UML之版本與年代演進



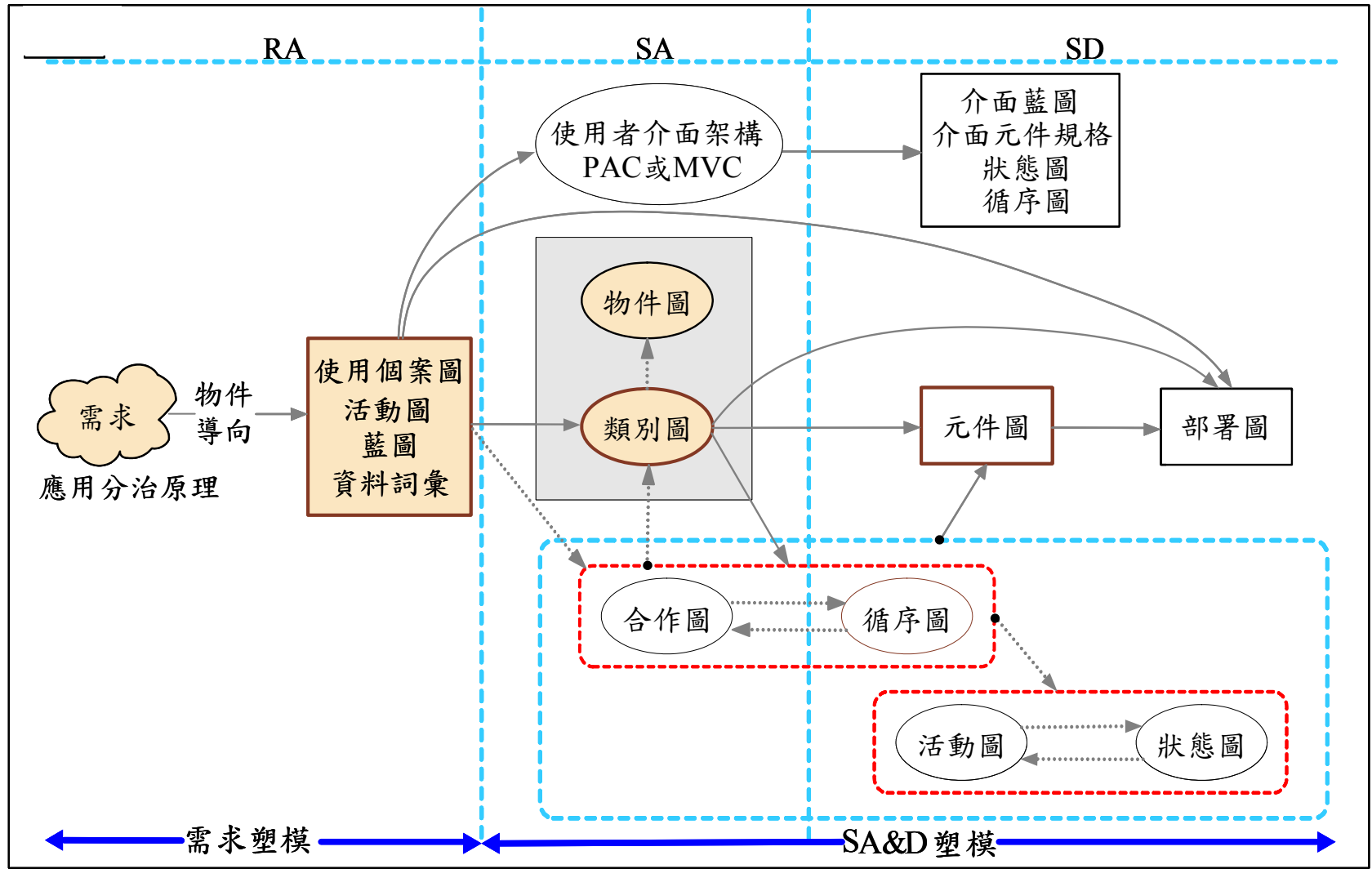
TBLink Technology Corp.  
(UML-Diagram's Relationship)



# 物件導向塑模活動及塑模工具



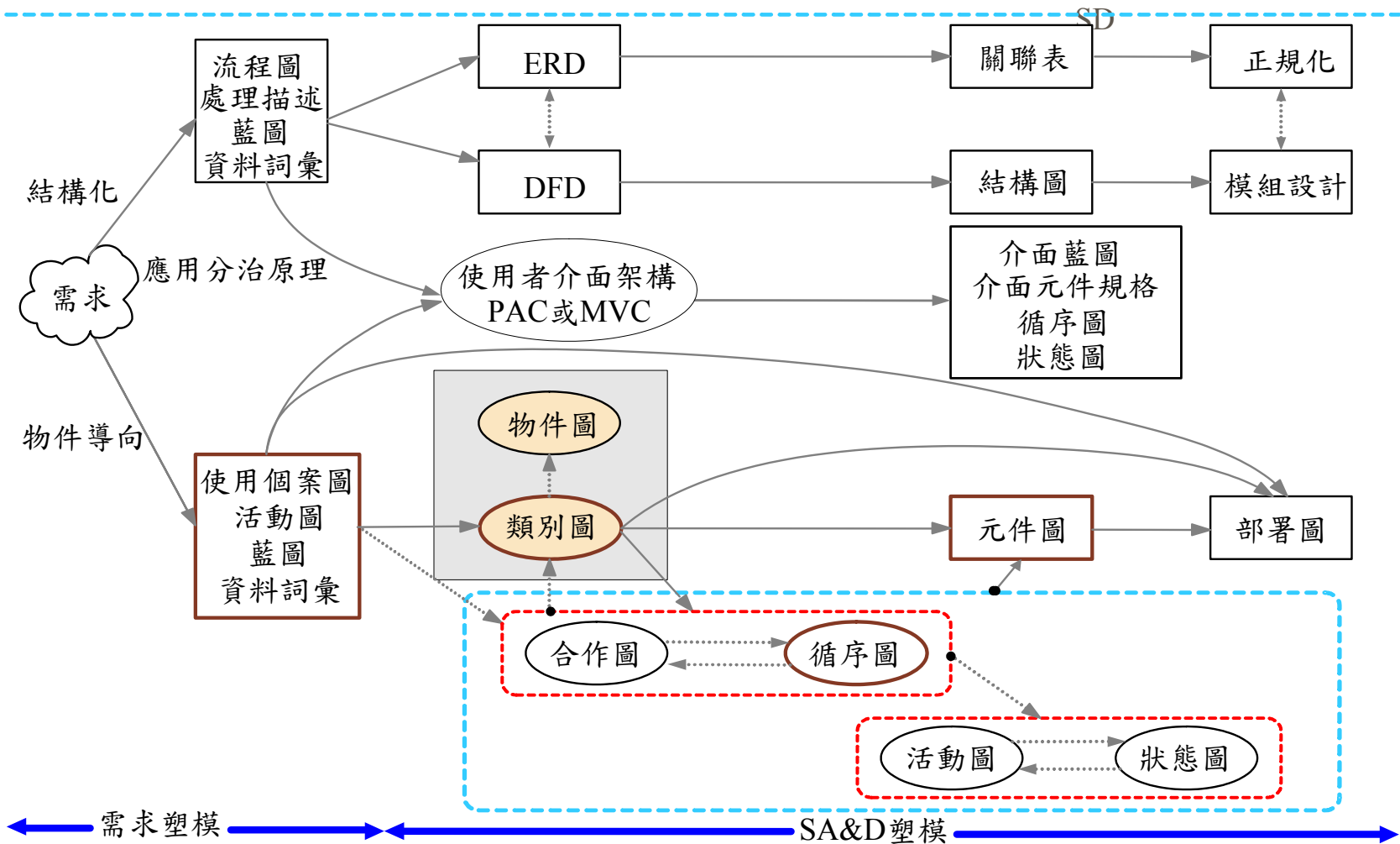
# 物件導向分析與設計與塑模工具之關係



# OOAD特色

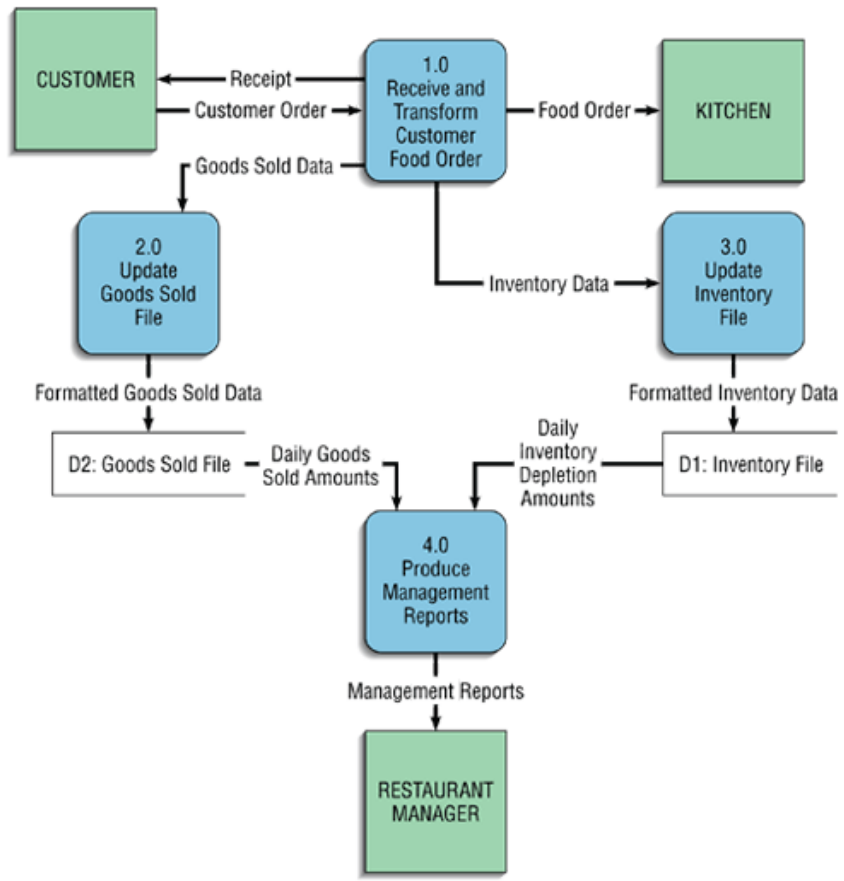
- 物件導向之系統開發過程是一種反覆的程序，主要包括需求分析、系統分析與設計、實施與測試等階段。
- 其中，需求分析主要以使用個案圖作為表達工具；而系統分析與設計主要以類別圖、物件圖、循序圖、合作圖、狀態圖、活動圖、元件圖與部署圖等表達。
- 物件導向應用一些重要的觀念包括物件、類別、封裝、繼承與同名異式及超荷等，使物件導向系統有別於結構化之系統。由於物件導向技術之引進，使軟體之開發與維護更有效率，亦提升了程式的再用性與可維護性。

# 分析與設計和塑模工具：結構化vs.物件導向



# DFD ( Data flow diagram)

**Figure 5.5** Four Separate Processes of the Hoosier Burger Food Ordering System



# UML Commercial Tools

## Most Popular UML Commercial Tools Available

### 1. Rational Corporation *Rose*

– Most widely used UML CASE tool from the publishers of UML.

### 2. Object Technology *TogetherJ*

– CASE Tool for use with Java or C++ & founded by Peter Coad.

### 3. WebGain *StructureBuilder*

### 4. Microsoft *Visio Enterprise Edition*

## OTHER commercially available tools ...

Advanced Software Technologies GDPro

Aonix StP/UML

Cayenne ObjectTeam

Confluent Visual Draw

Grade Development Group Modeler

I-Logix Rhapsody

Insoft Oy Prosoft UML Case

MicroGold WithClass

Object Domain Professional v2.5

No Magic Magic Draw UML

ObjecTime UML

Platinum Paradigm Plus

Popkin System Architect

Riverton HOW

Select Enterprise

Stingray Visual CASE

Visual Object Modelers Visual UML



# *What is Rational Rose?*

Rational Rose is a tool which provides the capability to create, view, modify, and manipulate UML views and diagrams.

Rose is available in four main editions:

## *Rose Modeler*

Data Modeler Pro  
Modeler  
Web Modeler

## *Rose Professional*

ADA  
C++  
J (Java)  
VB (Visual Basic)

*Rose Enterprise (includes tools for ALL Modeler & Professional Editions)*

*Rose RealTime & RealTime Pro*

# What does UML Employ?

It employs diagrams to describe different aspects of a software design.

View	Purpose	Diagram
<i>Functional View</i>	Describes basic functional requirements of the system	Use Case Diagram Activity Diagram
<i>Static Structural View</i>	Defines the static and non-temporal structure of the system	Class Diagram
<i>Behavior View</i>	Describes the temporal behavior of the system	Sequence Diagram Collaboration Diagram State Diagram
<i>Architectural View</i>	Outlines the logical and physical structure of the system's major building blocks.	- UML Package Diagram (Logical) - Component Diagram (Physical) - Deployment Diagram (Physical)