

企業流程分析與資料庫設計

Business Process Analysis and Data Modeling

企業流程與資訊系統

- 以訂單交期確認之企業流程為例

- 90 年代的企業競爭環境
- 客戶導向之企業組織
- 訂單交期確認之企業流程
- 資訊系統與企業資料庫
- 策略性再造工程

90 年代的企業競爭環境

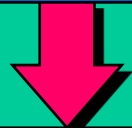
產品多樣性



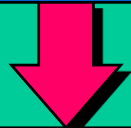
產品集積度



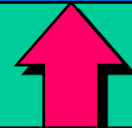
產品生命週期



研發到量產時間



客戶滿意度



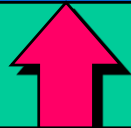
達交率



配銷通路



庫存週轉率



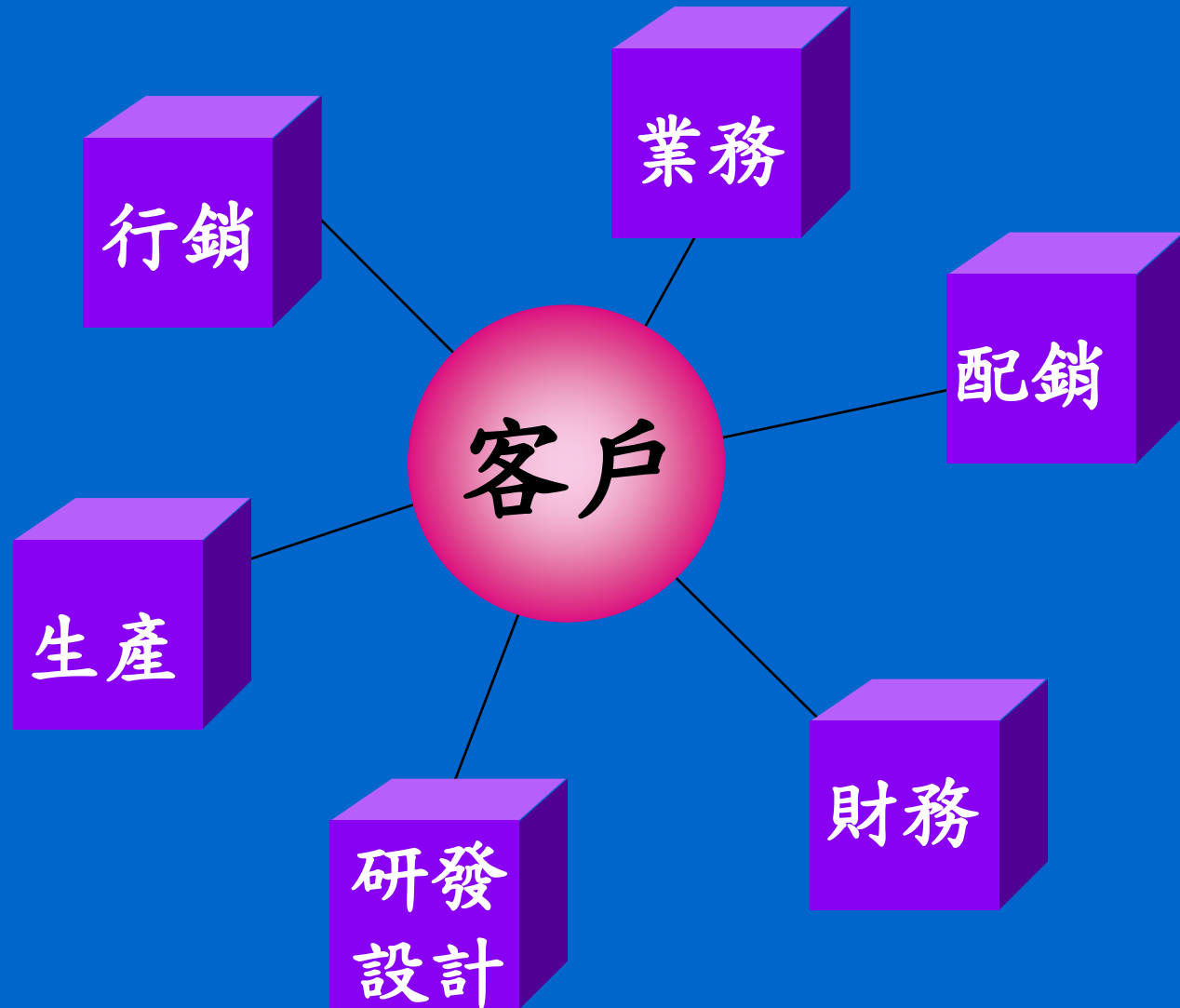
產品品質



資本密集



客戶導向之企業組織



訂單交期確認

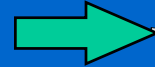
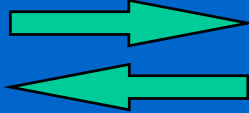
Customer

Order Entry

Order Check



Order



- . product status
- . price
- . terms
- . credit
- . sales plan

Real-time Quotation



Order Confirm



ATP Check

Oracle Application Display Manager - Oracle Applications

File Edit Settings Phone Help

Kang Sang Motors Define Forecast Sets 09-MAY-94

Forecast Sets		Consume		Outlier	
Name	Description	Level	Forecast Update	Percent	Disable
JUNFCSTSET	FORECAST SET FOR AUG 94	Yes	Item	100	
DECFCSTSET	FORECAST SET FOR DEC 94	Yes	Item	100	
JULFCSTSET	FORECAST SET FOR JULY 94	Yes	Item	100	
JUNFCSTSET	FORECAST SET FOR JUNE 94	Yes	Item	100	
MAYFCSTSET	FORECAST SET FOR MAY 94	Yes	Item	100	
NOVFCSTSET	FORECAST SET FOR NOV 94	Yes	Item	100	
OCTFCSTSET	FORECAST SET FOR OCT 94	Yes	Item	100	
SEPCSTSET	FORECAST SET FOR SEPT 94	Yes	Item	100	

Current Forecast Set Information

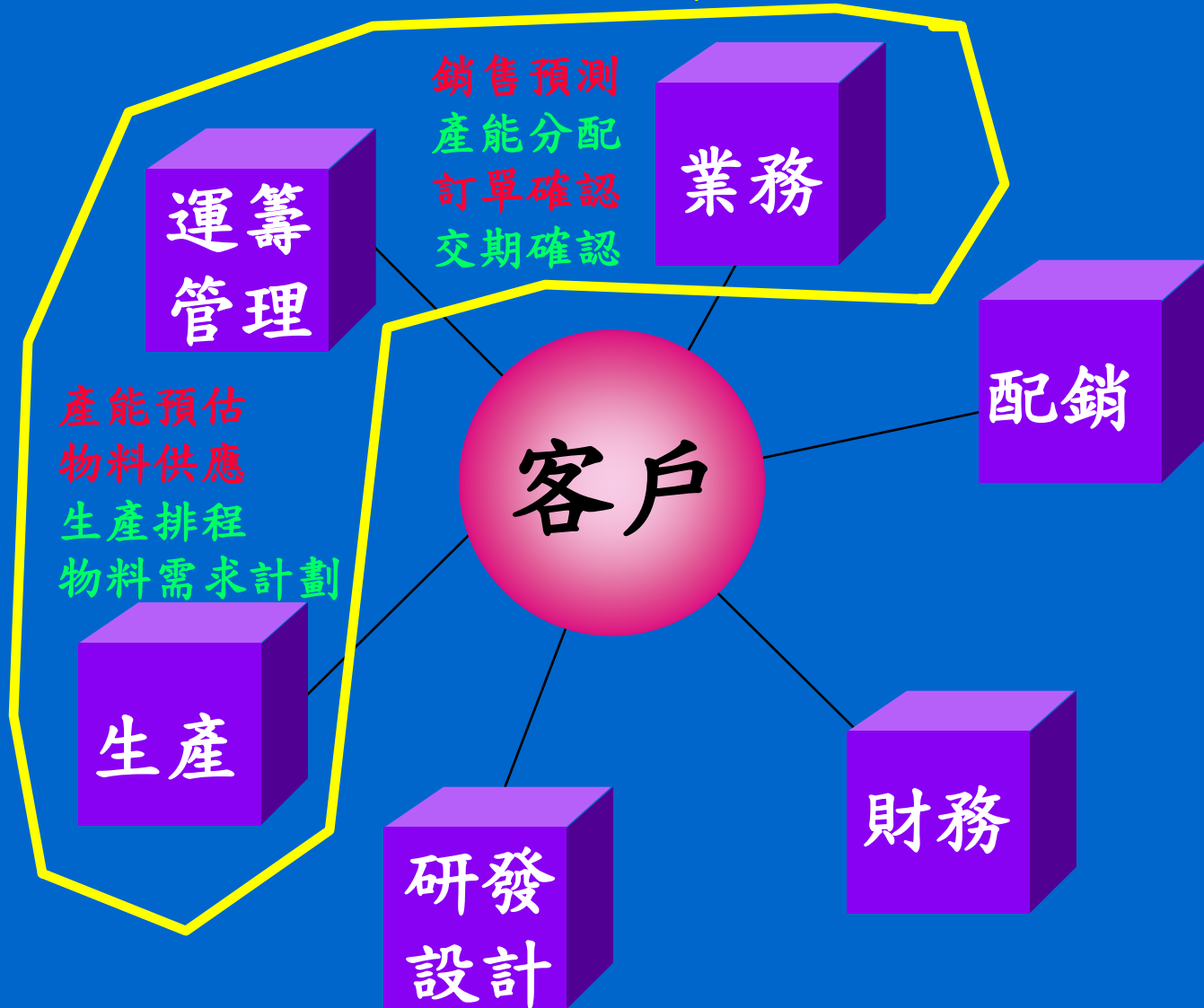
Bucket Weeks Forward Consumption Days 3 Backward Consumption Days 3

Forecast

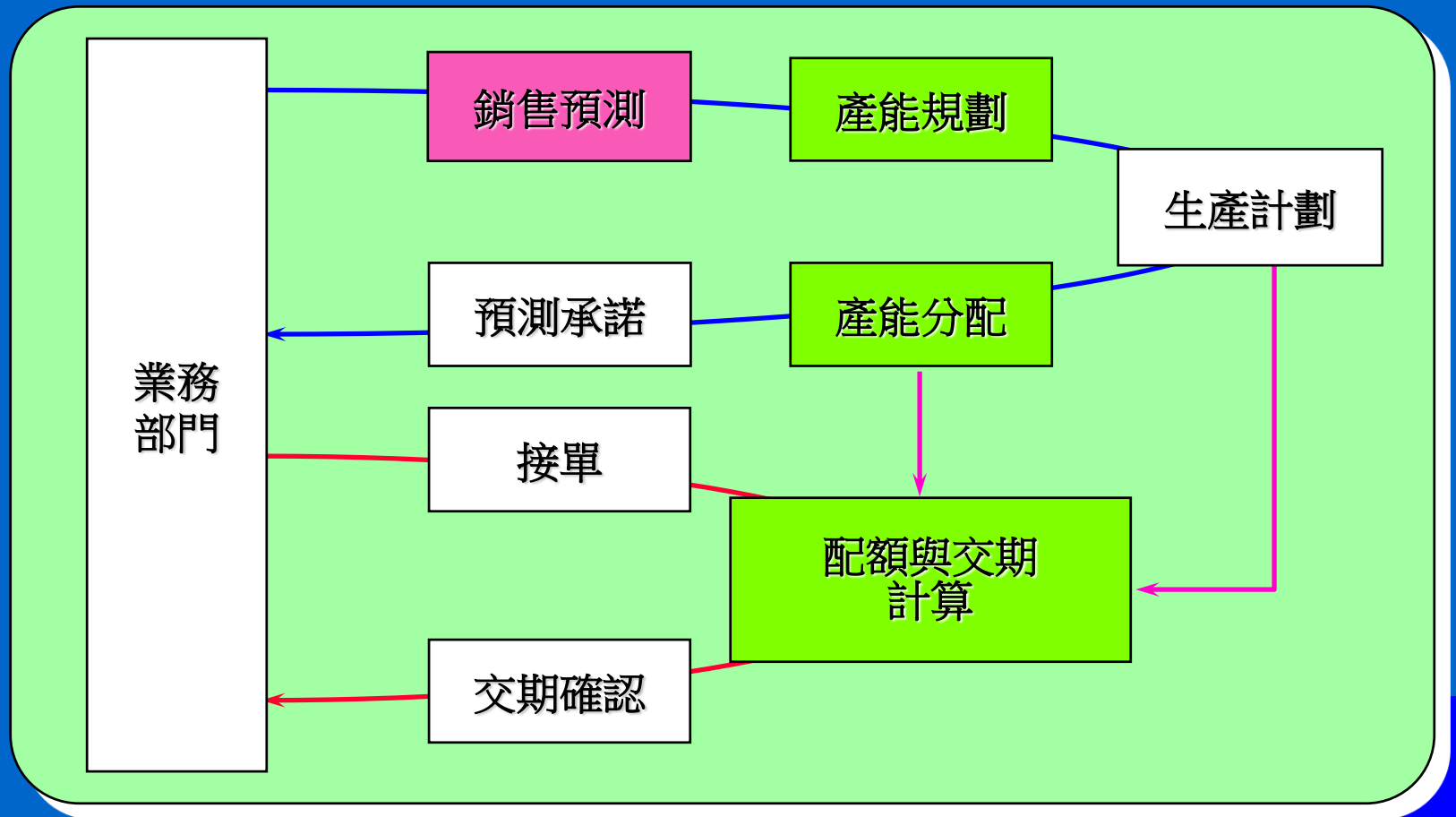
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Save Query Next Zone Prior Zone Next Row Prior Row QuickPick Exit

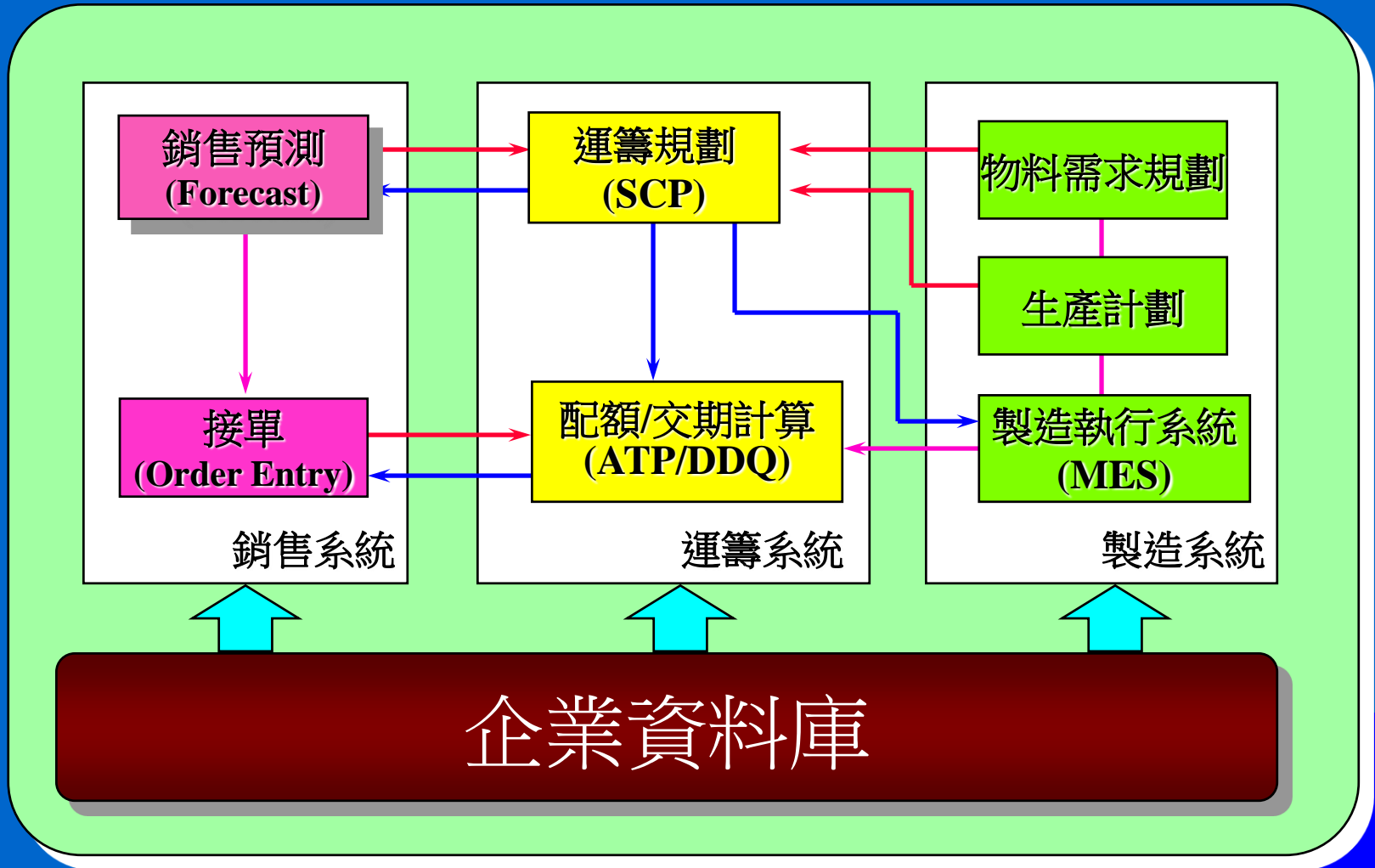
企業流程：訂單交期確認



企業流程：訂單交期確認



資訊系統與企業資料庫



策略性再造工程

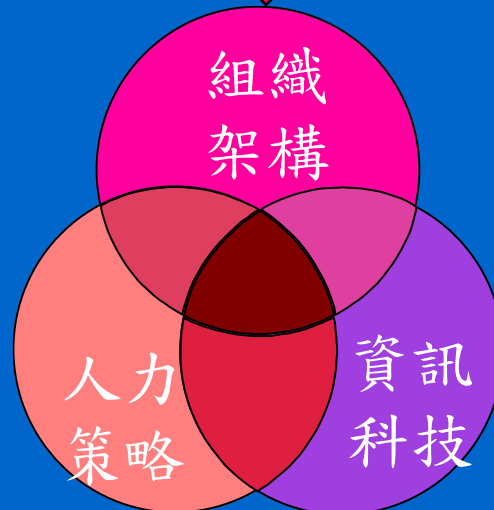
Strategic Reengineering

產業競爭分析 (SWOT)

確認成功關鍵要素 (CSF)

擬定競爭策略 (Strategy)

分析與設計企業流程 (BP)

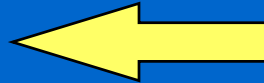
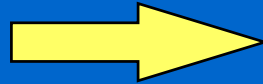
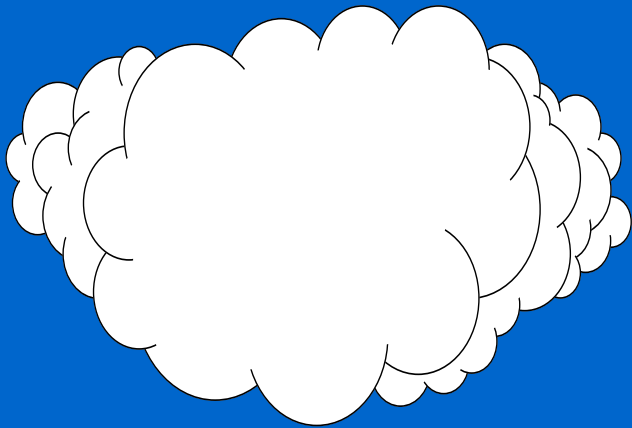


系統與模型：IDEF 方法論介紹

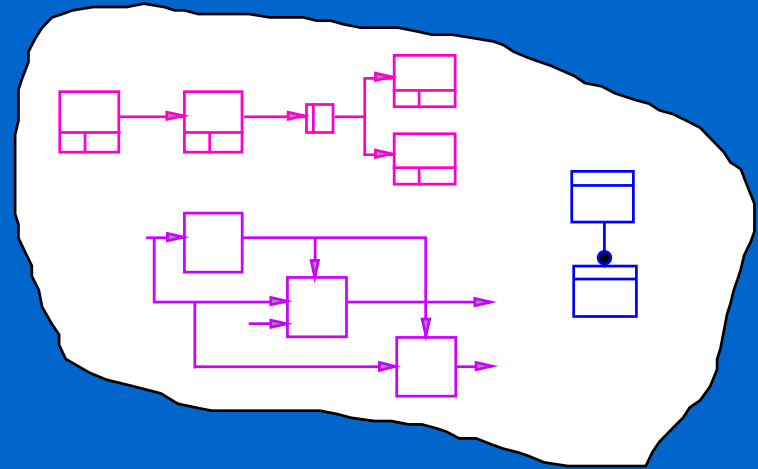
- 系統 vs. 模型
- IDEF 分析方法起源
- IDEF 分析方法家族
- IDEF0 系統功能分析
- IDEF3 作業流程知識擷取
- IDEF1X 資訊分析方法
- 整合 IDEF 方法分析系統建立模型

系統 vs. 模型

系統



模型



系統分析的目的

- 確認經營目標與系統之關係 (Business Driver)
- 擷取與分析現有系統 (AS-IS Model)
- 人員溝通 (Communication)
- 作業標準書 (Specification)
- 新進人員訓練 (Training)
- 制定/改造作業流程 (TO-BE Model)

IDEF 分析方法起源

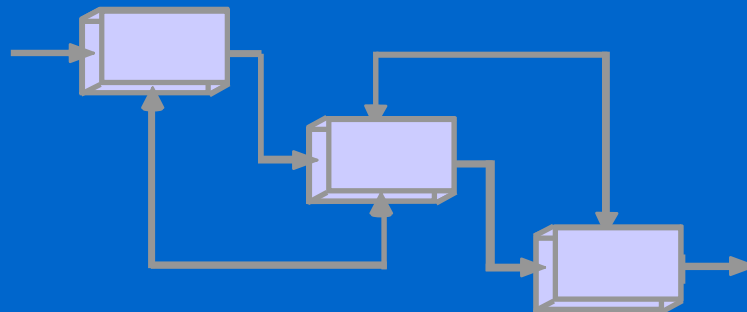
- IDEF 是一種規格整合技術，源於結構化分析與設計技術 (SADT)，可以將一個複雜的系統 (System)，以結構化的模型 (Model) 表示，藉此了解系統的特性與問題。
- IDEF : ICAM DEFinition Method, USAF, 1981
 - ICAM : Integrated Computer-Aided Manufacturing
 - IICE : Integrated Information for Concurrent Engineering
- IDEF 普遍成功應用在混合系統案例上，即牽涉到人員，軟體(程序制度)，硬體(設備)間相互關係的系統。例如：物流分析規劃，自動化，企業再造，作業流程規劃，整合資訊系統發展，系統整合與系統轉換等。
- IDEF0/IDEF1X : FIPS-183/184, NIST, Dec. 21, 1993

IDEF 分析方法家族

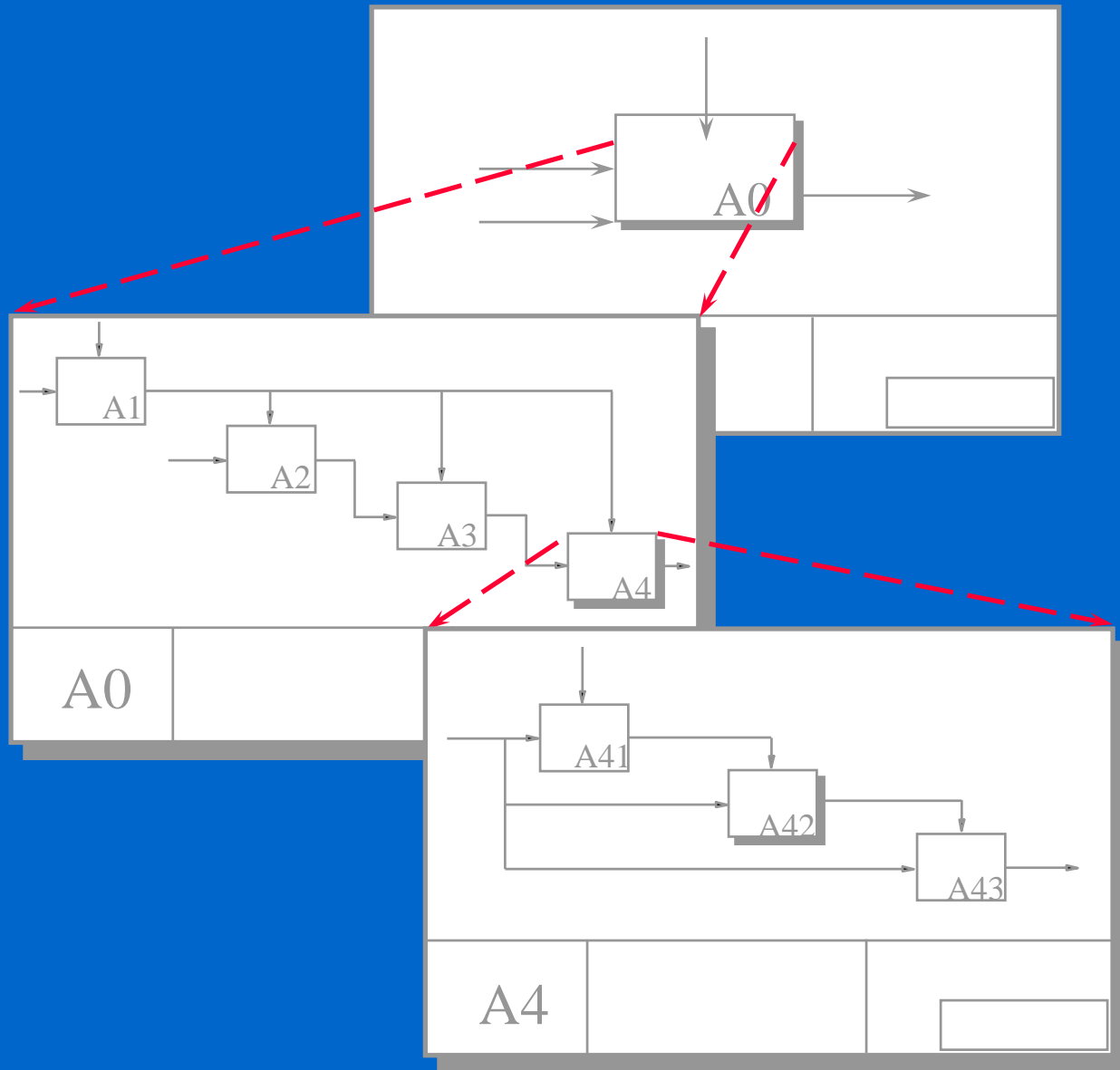
- IDEF0 系統功能分析
Function Modeling 
- IDEF1/1X 資訊分析與資料庫設計
Information/Data Modeling 
- IDEF3 作業流程知識擷取
Process Description Capture 
- IDEF4 物件導向軟體設計
Object-Oriented Design 
- IDEF5 物件與物件關係資訊擷取
Ontology Description Capture 
- IDEF9 作業限制條件知識擷取
Business Systems Constraint Discovery

IDEF0 系統功能分析

- 表達系統功能與作業
- 表達系統之輸入(Input), 控制(Control), 輸出(Output) 與資源 (Mechanism)
- 表達物流, 資訊流與決策控制法則
- 表達由上而下功能結構 (Decomposition)
- 表達現有 (AS-IS) 系統或目標 (TO-BE) 系統



IDEF0 結構分解



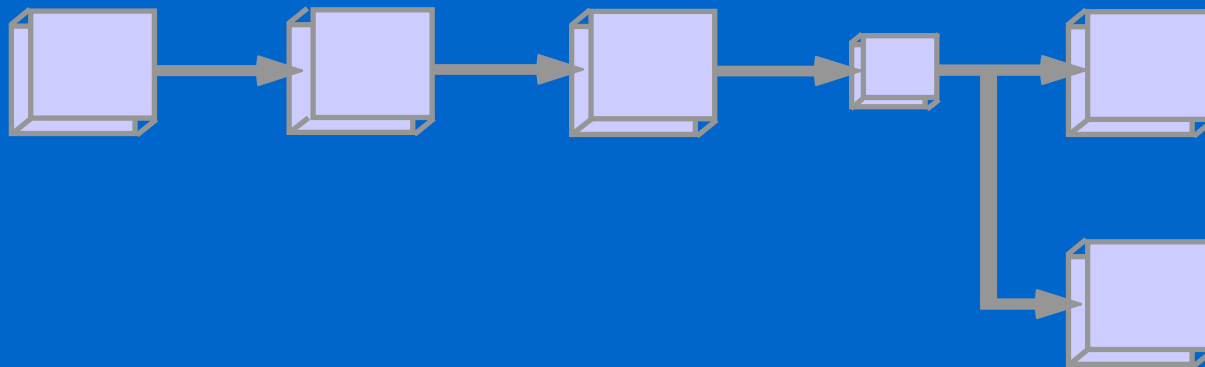
**More
General
(Parent)**



**More
Detailed
(Child)**

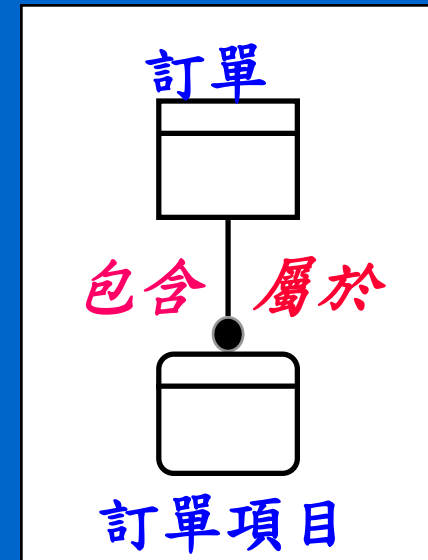
IDEF3 作業流程知識擷取

- 快速擷取企業流程, 決策邏輯, 作業知識
- 表達流程中各項作業先後順序 (Temporal Constraints)
- 表達決策邏輯: AND, OR, XOR and SYNC., ASYNC.
- 表達物件: Entity, Location, Resource, Queue, Transport
- 表達由上而下功能結構 (Decomposition)
- 表達現有 (AS-IS) 系統或目標 (TO-BE) 系統
- 可以多個劇本 (Scenario) 表達不同視角之流程
- 可做為 Simulation 模型之前處理作業



IDEF1X 資訊分析方法

- 起源：ER(Chen), Relational(Codd), Aggregation(Smith), and Elka(Hughes Aircraft)
- Entity, Relationship, Key, Attribute
- Semantic Data Model
 - 一張 訂單 可包含 一或多筆 訂單項目
 - 一筆 訂單項目 必屬於 一張 訂單
- Model Evolution
 - ER Model
 - Key-Based Model
 - Fully-Attributed Model
 - Database Model



整合 IDEF 方法分析系統建立模型

效率評估 (Simulation)
作業成本評估 (ABC)



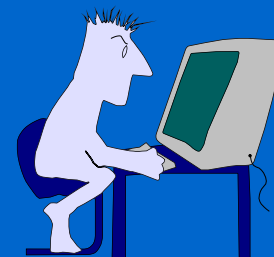
IDEF0
系統功能分析



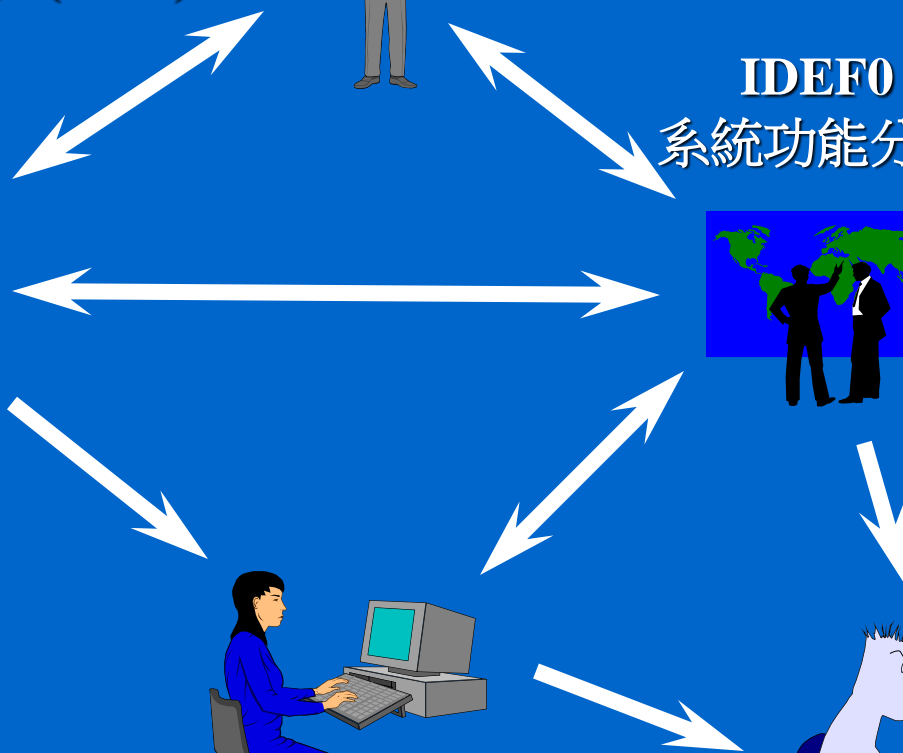
IDEF3
作業流程分析
知識擷取



IDEF1X, IDEF4
資訊模型分析設計



軟體系統發展



資訊系統再造

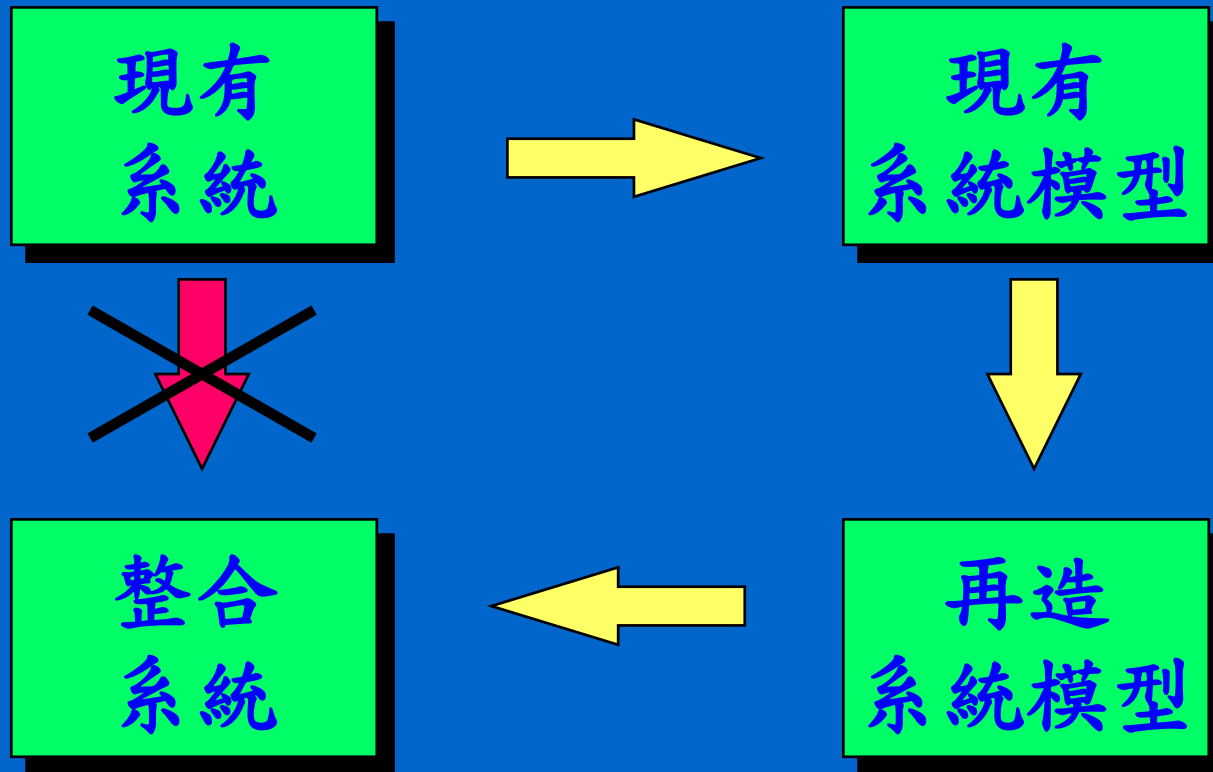
- 系統再造工程
- 資訊系統架構演化
- 資料庫設計的三層式架構
- 企業流程分析與資訊模型分析
- 資訊模型庫 (Model Repository)
- IDEF1X 資訊模型種類
- 資訊模型建構程序

系統再造工程

System Re-engineering

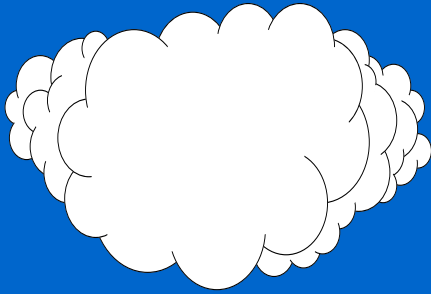
系統

模型

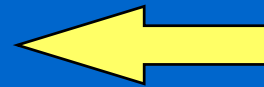
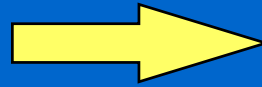
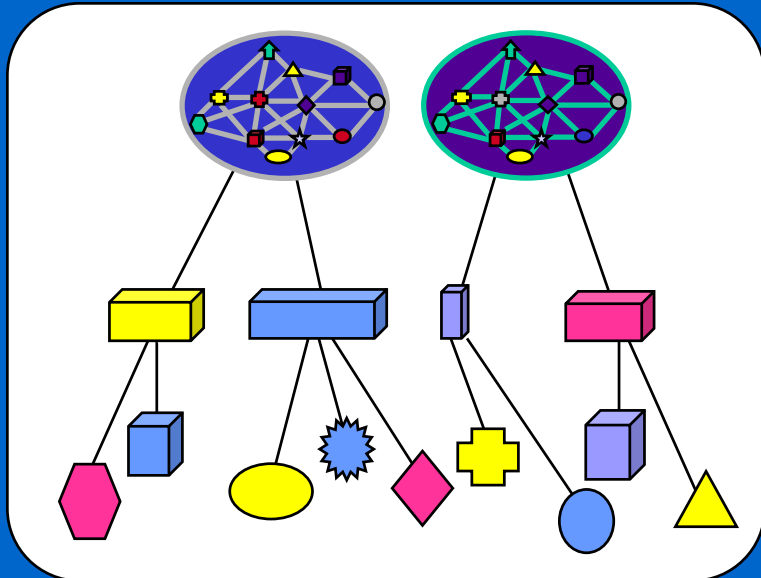
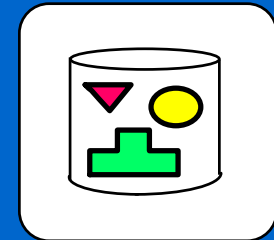
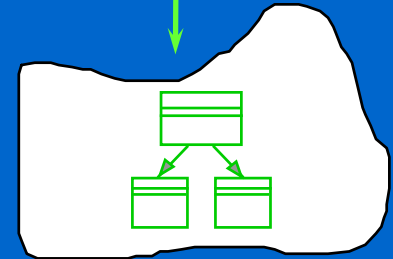
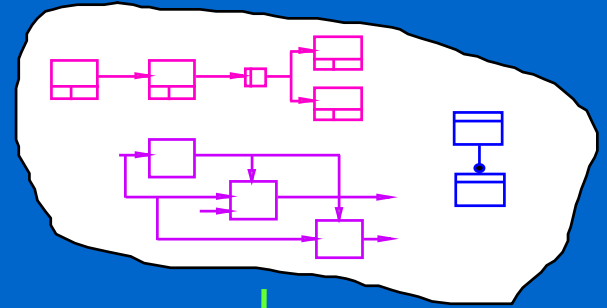


系統再造程序

系統

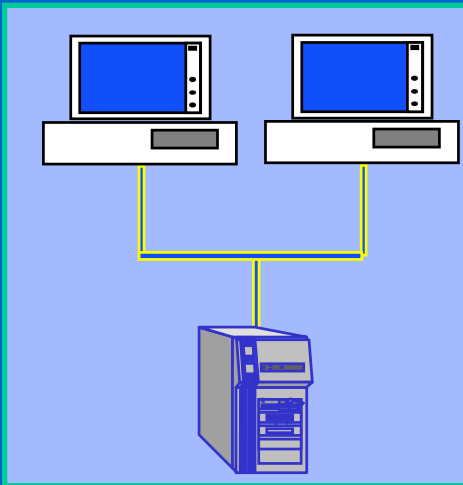


模型

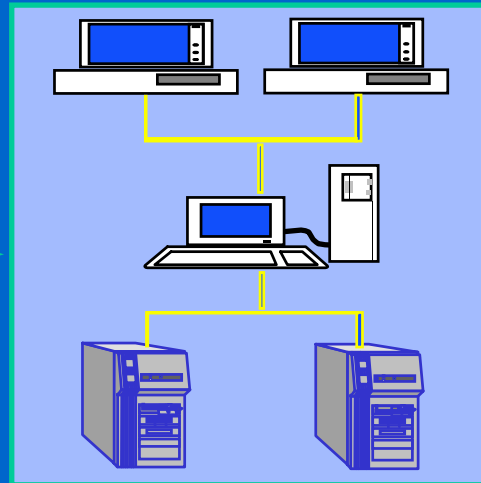


資訊系統架構演進

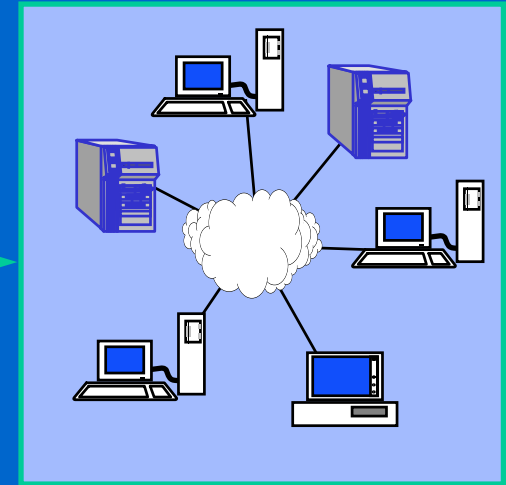
2-Tier



3-Tier



Tier-less



- 以單一部門發展的兩層式主從架構
- 配合企業流程間多個部門交互作用的三層式主從架構
- 由消費者至供應商跨企業網路架構
- 快速反應的企業營運策略挑戰資訊系統的適用性

傳統的二層式主從架構

Name	Description	Consume Level	Outlier Level	Forecast Update Percent	Outlier Update Percent	Disable Date	More (f)
WUPCISEI	FORECAST SET FOR AUG 94	Yes	Item	100	100		
DECPCISEI	FORECAST SET FOR DEC 94	Yes	Item	100	100		
JULPCISEI	FORECAST SET FOR JULY 94	Yes	Item	100	100		
JUNPCISEI	FORECAST SET FOR JUNE 94	Yes	Item	100	100		
MAYPCISEI	FORECAST SET FOR MAY 94	Yes	Item	100	100		
NOVPCISEI	FORECAST SET FOR NOV 94	Yes	Item	100	100		
OCTPCISEI	FORECAST SET FOR OCT 94	Yes	Item	100	100		
SEPPCISEI	FORECAST SET FOR SEPT 94	Yes	Item	100	100		

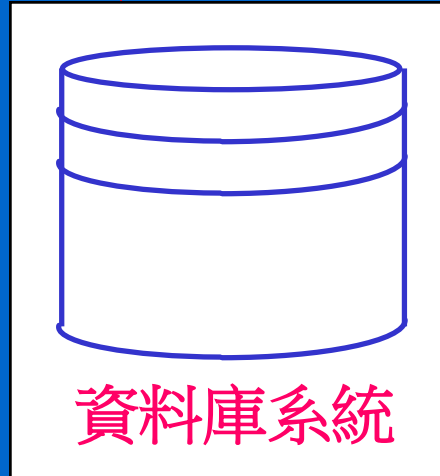
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WUPCISEI	FORECAST SET FOR AUG 94	Yes	Item	100	100		
DECPCISEI	FORECAST SET FOR DEC 94	Yes	Item	100	100		
JULPCISEI	FORECAST SET FOR JULY 94	Yes	Item	100	100		
JUNPCISEI	FORECAST SET FOR JUNE 94	Yes	Item	100	100		
MAYPCISEI	FORECAST SET FOR MAY 94	Yes	Item	100	100		
NOVPCISEI	FORECAST SET FOR NOV 94	Yes	Item	100	100		
OCTPCISEI	FORECAST SET FOR OCT 94	Yes	Item	100	100		
SEPPCISEI	FORECAST SET FOR SEPT 94	Yes	Item	100	100		

Name	Description	Consume Level	Outlier Level	Forecast Update Percent	Outlier Update Percent	Disable Date	More (f)
WUPCISEI	FORECAST SET FOR AUG 94	Yes	Item	100	100		
DECPCISEI	FORECAST SET FOR DEC 94	Yes	Item	100	100		
JULPCISEI	FORECAST SET FOR JULY 94	Yes	Item	100	100		
JUNPCISEI	FORECAST SET FOR JUNE 94	Yes	Item	100	100		
MAYPCISEI	FORECAST SET FOR MAY 94	Yes	Item	100	100		
NOVPCISEI	FORECAST SET FOR NOV 94	Yes	Item	100	100		
OCTPCISEI	FORECAST SET FOR OCT 94	Yes	Item	100	100		
SEPPCISEI	FORECAST SET FOR SEPT 94	Yes	Item	100	100		

銷售系統

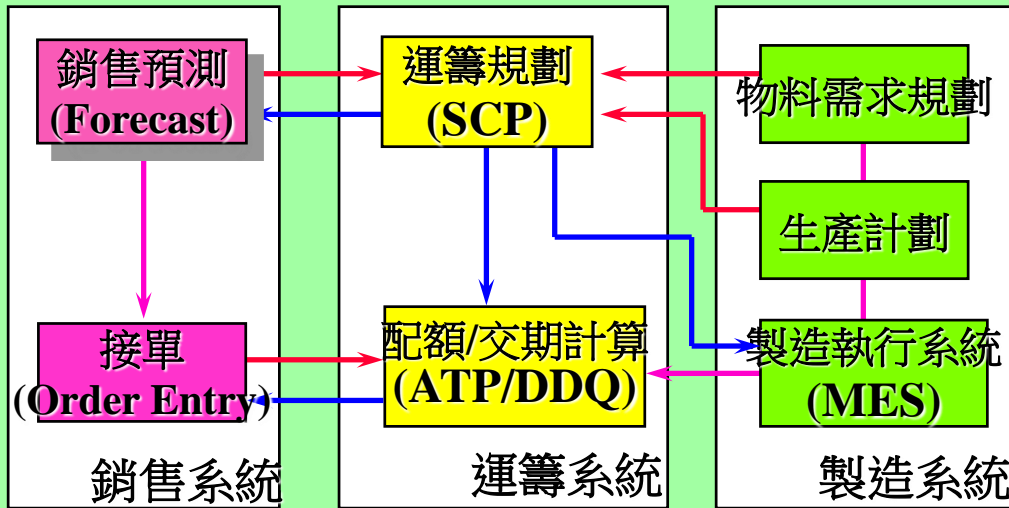
運籌系統

製造系統



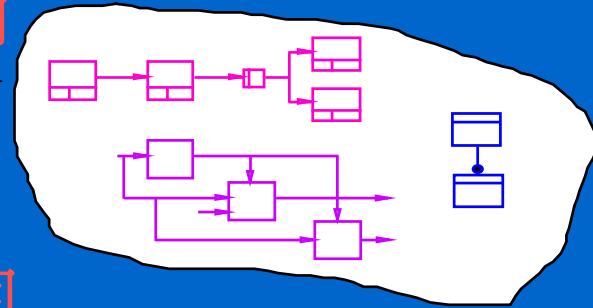
資訊系統與企業模型

- 系統整合
- 系統轉換
- 系統發展
- 規則與知識擷取



反向

正向



資料庫設計的三層式架構

Name	Description	Forecast	Outlier	Disable	More
WUPFCST123	FORECAST SET FOR AUG 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JULY 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JUN 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR MAY 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR APR 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR MAR 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR FEB 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JAN 94	Item	Item	Item	Item

Name	Description	Forecast	Outlier	Disable	More
WUPFCST123	FORECAST SET FOR AUG 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JULY 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JUN 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR MAY 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR APR 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR MAR 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR FEB 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JAN 94	Item	Item	Item	Item

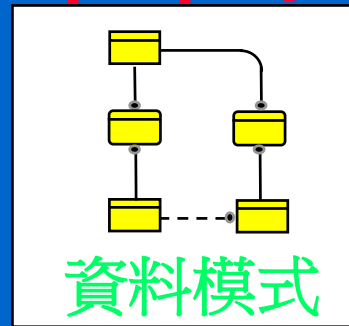
Name	Description	Forecast	Outlier	Disable	More
WUPFCST123	FORECAST SET FOR AUG 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JULY 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JUN 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR MAY 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR APR 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR MAR 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR FEB 94	Item	Item	Item	Item
WUPFCST123	FORECAST SET FOR JAN 94	Item	Item	Item	Item

銷售系統

運籌系統

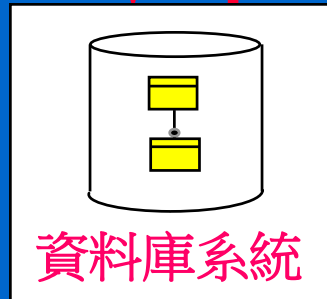
製造系統

產生使用界面規格



正向工程

反向工程



企業流程分析與三層式架構

Name	Description	Forecast Update	Level	Percent	Date	More ()
W1MPC1231	FORECAST SET FOR AUG 94	Item	Item	100	Item	
W1MPC1232	FORECAST SET FOR JULY 94	Item	Item	100	Item	
W1MPC1233	FORECAST SET FOR JUN 94	Item	Item	100	Item	
W1MPC1234	FORECAST SET FOR MAY 94	Item	Item	100	Item	
W1MPC1235	FORECAST SET FOR APR 94	Item	Item	100	Item	
W1MPC1236	FORECAST SET FOR MAR 94	Item	Item	100	Item	
W1MPC1237	FORECAST SET FOR FEB 94	Item	Item	100	Item	
W1MPC1238	FORECAST SET FOR JAN 94	Item	Item	100	Item	

Name	Description	Forecast Update	Level	Percent	Date	More ()
W1MPC1231	FORECAST SET FOR AUG 94	Item	Item	100	Item	
W1MPC1232	FORECAST SET FOR JULY 94	Item	Item	100	Item	
W1MPC1233	FORECAST SET FOR JUN 94	Item	Item	100	Item	
W1MPC1234	FORECAST SET FOR MAY 94	Item	Item	100	Item	
W1MPC1235	FORECAST SET FOR APR 94	Item	Item	100	Item	
W1MPC1236	FORECAST SET FOR MAR 94	Item	Item	100	Item	
W1MPC1237	FORECAST SET FOR FEB 94	Item	Item	100	Item	
W1MPC1238	FORECAST SET FOR JAN 94	Item	Item	100	Item	

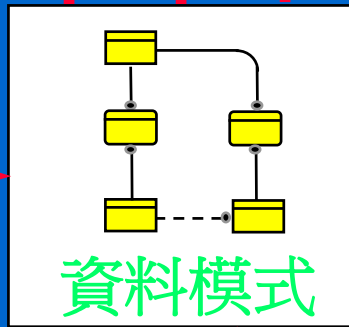
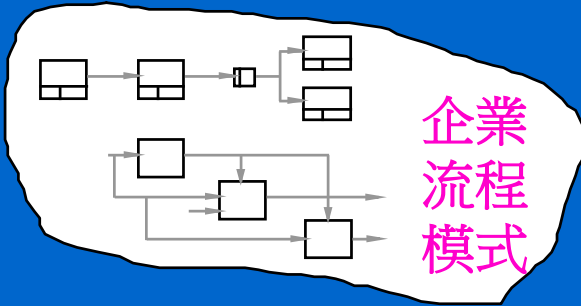
Name	Description	Forecast Update	Level	Percent	Date	More ()
W1MPC1231	FORECAST SET FOR AUG 94	Item	Item	100	Item	
W1MPC1232	FORECAST SET FOR JULY 94	Item	Item	100	Item	
W1MPC1233	FORECAST SET FOR JUN 94	Item	Item	100	Item	
W1MPC1234	FORECAST SET FOR MAY 94	Item	Item	100	Item	
W1MPC1235	FORECAST SET FOR APR 94	Item	Item	100	Item	
W1MPC1236	FORECAST SET FOR MAR 94	Item	Item	100	Item	
W1MPC1237	FORECAST SET FOR FEB 94	Item	Item	100	Item	
W1MPC1238	FORECAST SET FOR JAN 94	Item	Item	100	Item	

銷售系統

運籌系統

製造系統

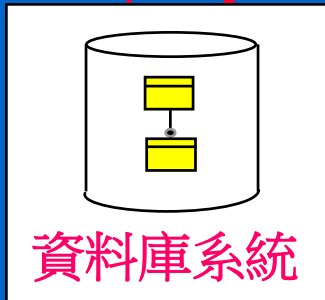
產生使用界面規格



企業流程分析

正向工程

反向工程



企業模型庫 (Model Repository)

Name	Description	Consumption Level	Forecast Update	Outlier Percent	Disable Date	More ()
WUPFCSTSET	FORECAST SET FOR AUG 94	Item	Item	100	Item	Item
WULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJUNFCSTSET	FORECAST SET FOR JUN 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
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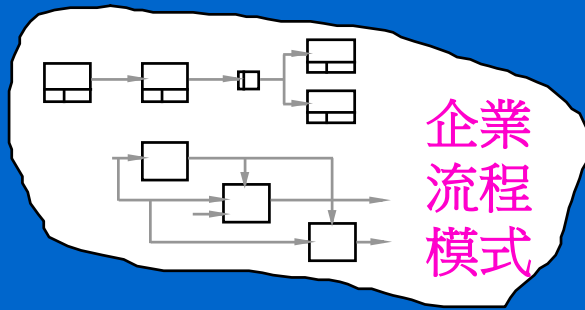
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WUPFCSTSET	FORECAST SET FOR AUG 94	Item	Item	100	Item	Item
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WJUNFCSTSET	FORECAST SET FOR JUN 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item

Name	Description	Consumption Level	Forecast Update	Outlier Percent	Disable Date	More ()
WUPFCSTSET	FORECAST SET FOR AUG 94	Item	Item	100	Item	Item
WULFCSTSET	FORECAST SET FOR JULY 94	Item	Item	100	Item	Item
WJUNFCSTSET	FORECAST SET FOR JUN 94	Item	Item	100	Item	Item
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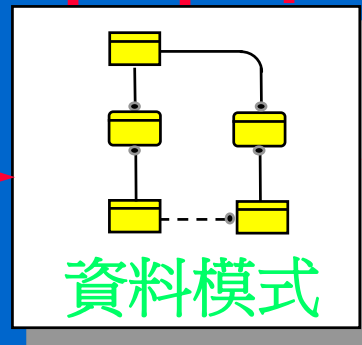
銷售系統

運籌系統

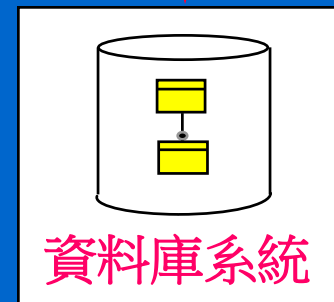
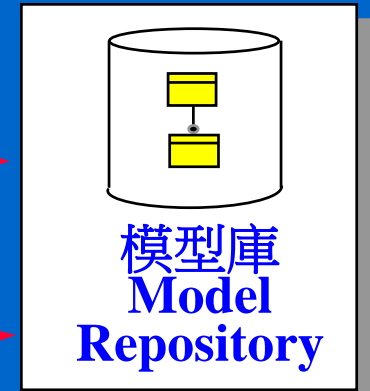
製造系統



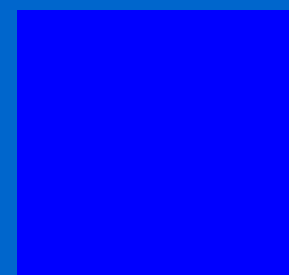
企業流程分析



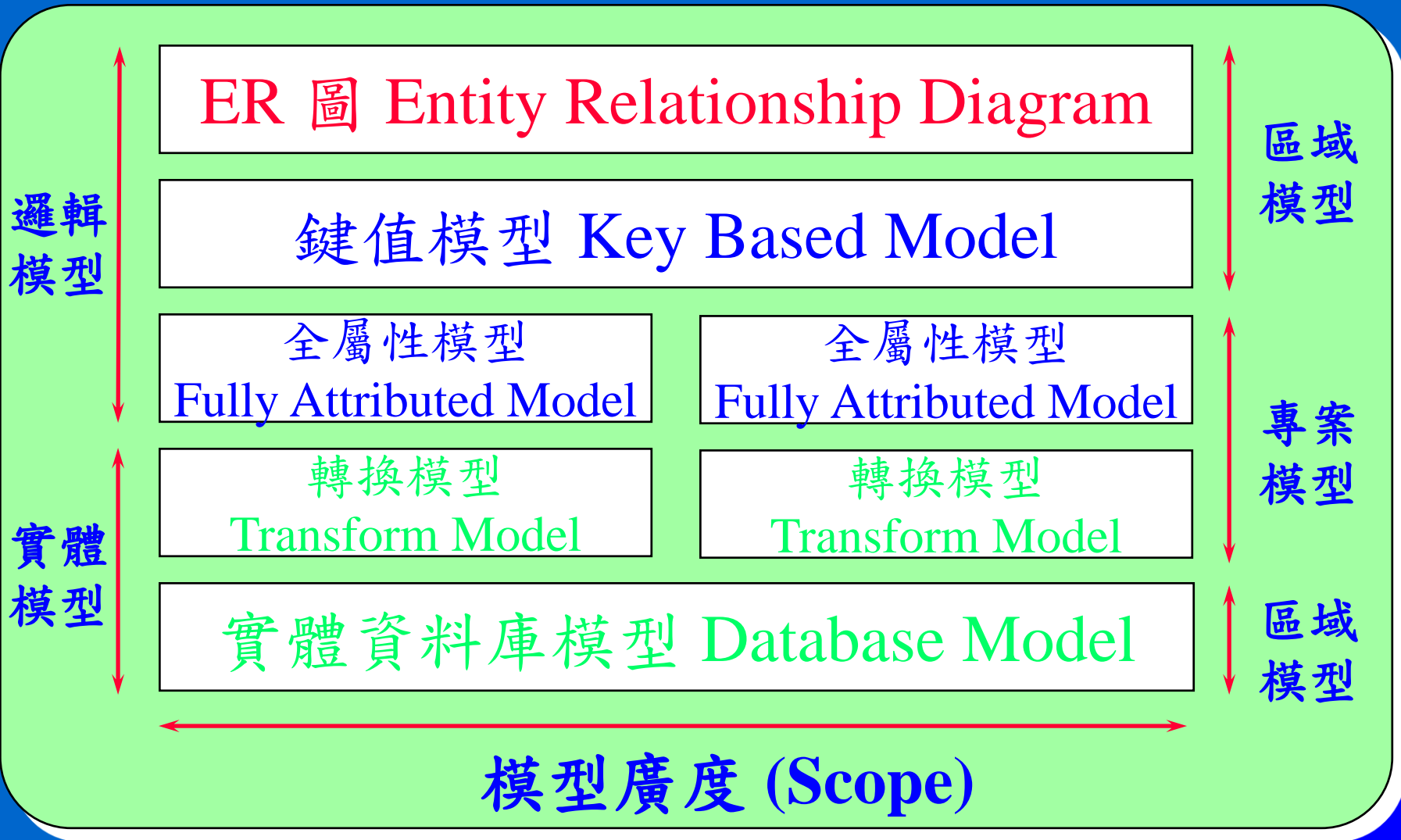
模型管理



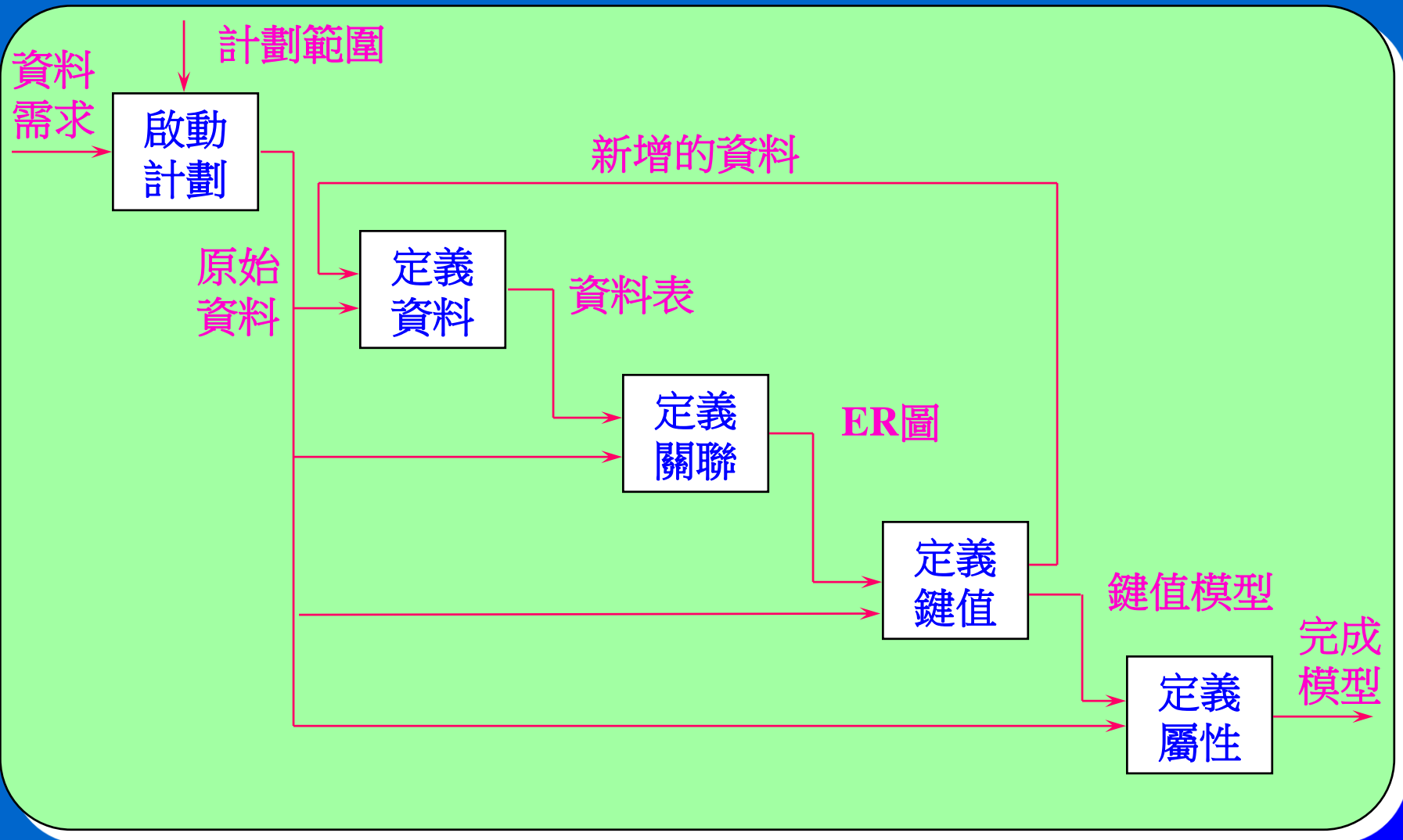
完全一致



IDEF1X 模型種類



資訊模型建構程序之流程圖



結論

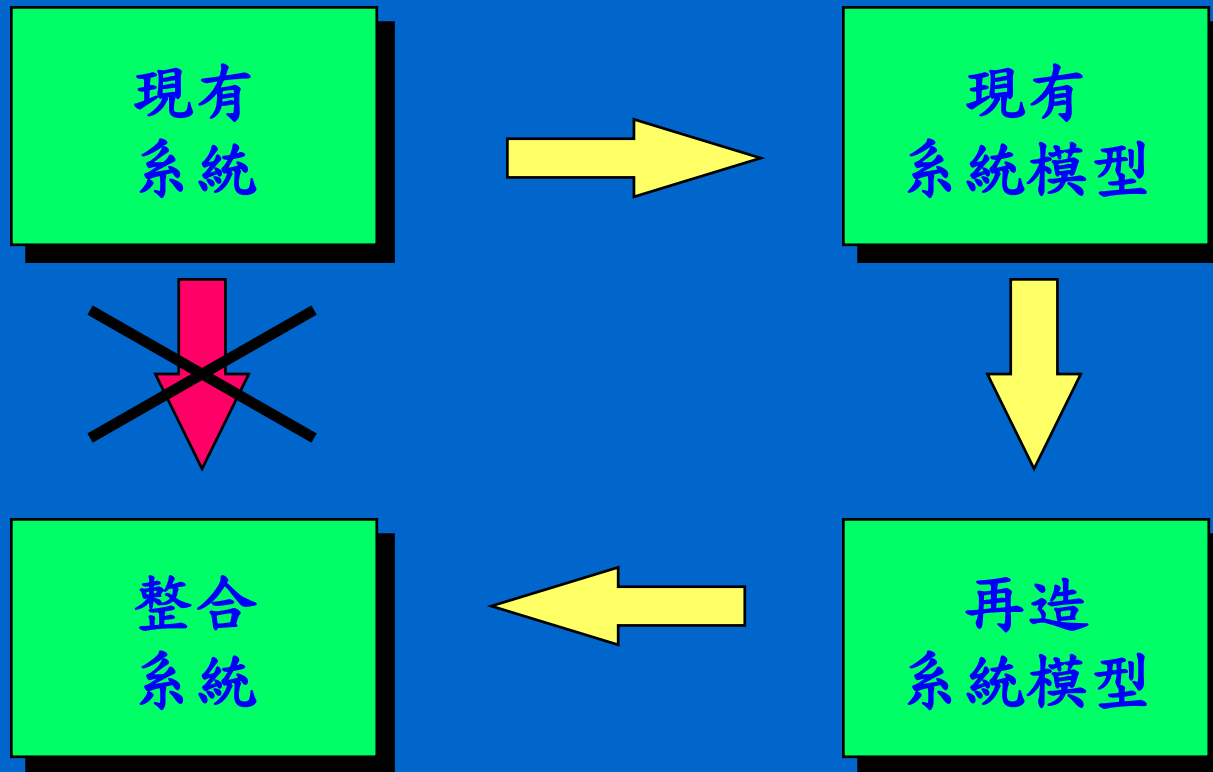
- 系統再造工程
- 回顧企業流程分析與資料模型
- 整合分析方法與發展資訊系統
- 企業再造與軟體再造

系統再造工程

System Re-engineering

系統

模型



回顧整合 IDEF 分析方法建立模型

效率評估 (Simulation)
作業成本評估 (ABC)



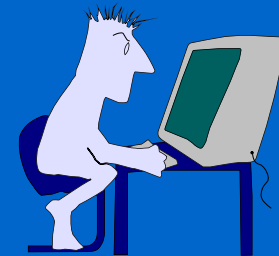
IDEF0
系統功能分析



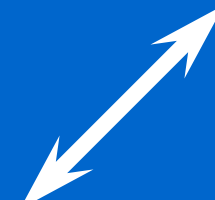
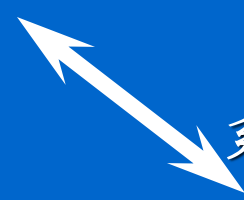
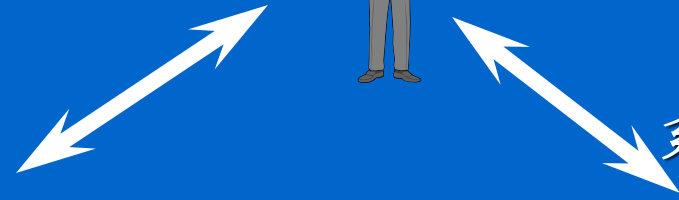
IDEF3
作業流程分析
知識擷取



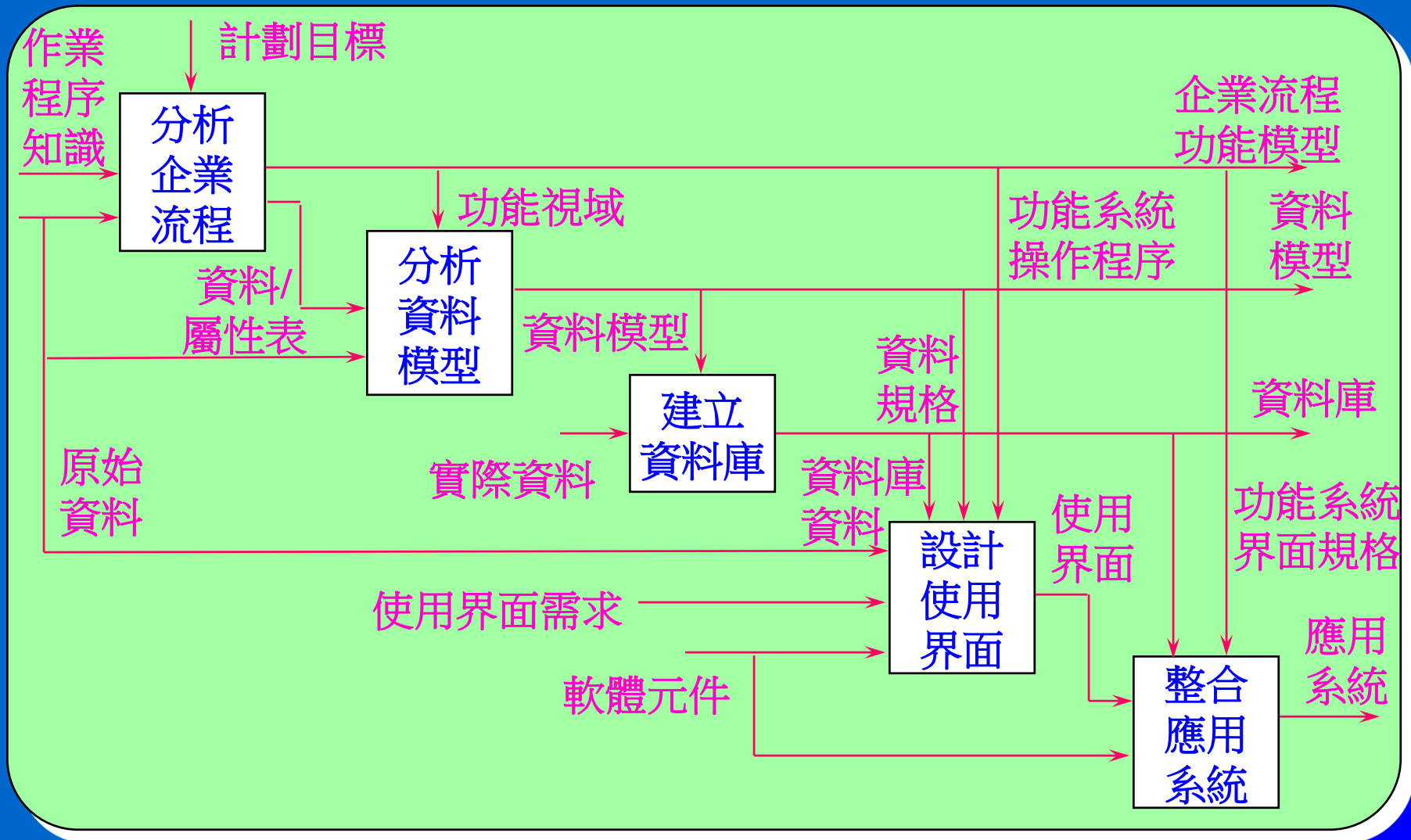
IDEF1X, IDEF4
資訊模型分析設計



軟體系統發展

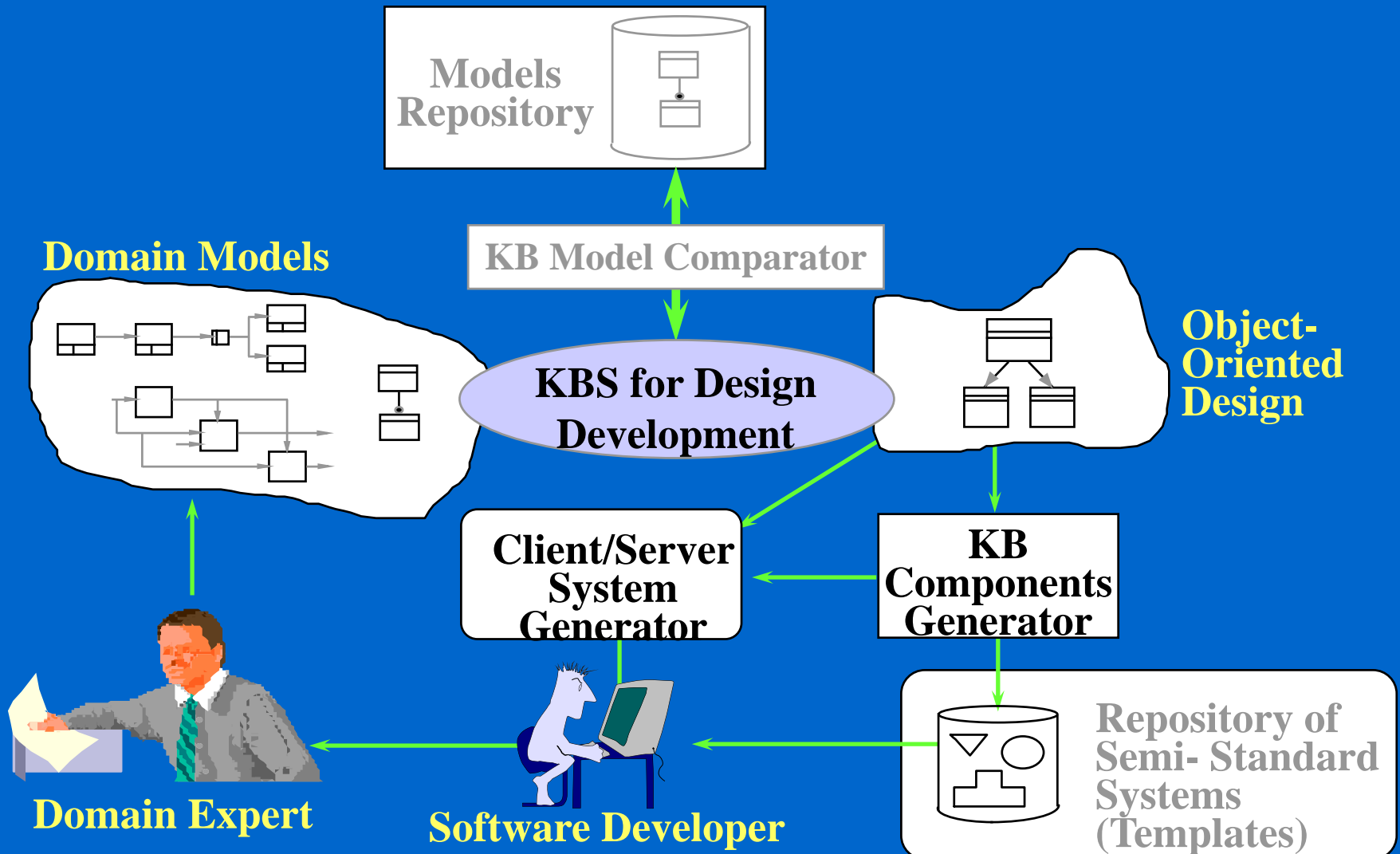


整合分析方法與發展資訊系統



從企業工程到軟體工程

From Business Engineering to Software Engineering



企業再造與軟體再造

