Discovering Computers 2016

Tools, Apps, Devices, and the Impact of Technology

Chapter 12 Working in the Enterprise

Information Systems in the Enterprise

Information Systems in the Enterprise

- An **information system** is a set of hardware, software, data, people, and procedures that work together to produce information

  資訊系統是由硬體、軟體、資料、人，和程序組成共同工作產生資訊

- To assist with sound decision making, information must have value

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Qualities of valuable information

- For information to be valuable, it should be

珍貴資訊特徵

Accurate
正確

Verifiable
可證實

Timely
及時

Organized
有系統(組織)

Accessible
可取得(無障礙)

Useful
有用

Cost-effective
具成本效益

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Qualities of valuable information

- **Accurate information** is error free. Inaccurate information can lead to incorrect decisions.
- **Verifiable information** can be proven as correct or incorrect.
- **Timely information** has an age suited to its use. Most information loses value with time.
- **Organized information** is arranged to suit the needs and requirements of the decision maker. Two different people may need the same information presented in a different manner.

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Qualities of valuable information

- **Accessible information** is available when the decision maker needs it. Having to wait for information may delay an important decision.
- **Useful information** has meaning to the person who receives it. Most information is important only to certain people or groups of people. Always consider the audience when collecting and reporting information. Avoid distributing useless information.

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Qualities of valuable information

- **Cost-effective information** should provide more value than it costs to produce.
  - An organization occasionally should review the information it produces to determine if it still is cost effective to produce. Sometimes, it is not easy to place a value on information.
  - For this reason, some organizations create information only on demand, that is, as people request it, instead of on a regular basis. Many make information available online so that users can access it as they need it.

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Daily, Short-Term, and Long-Range Information Requirements of Users

資料收集

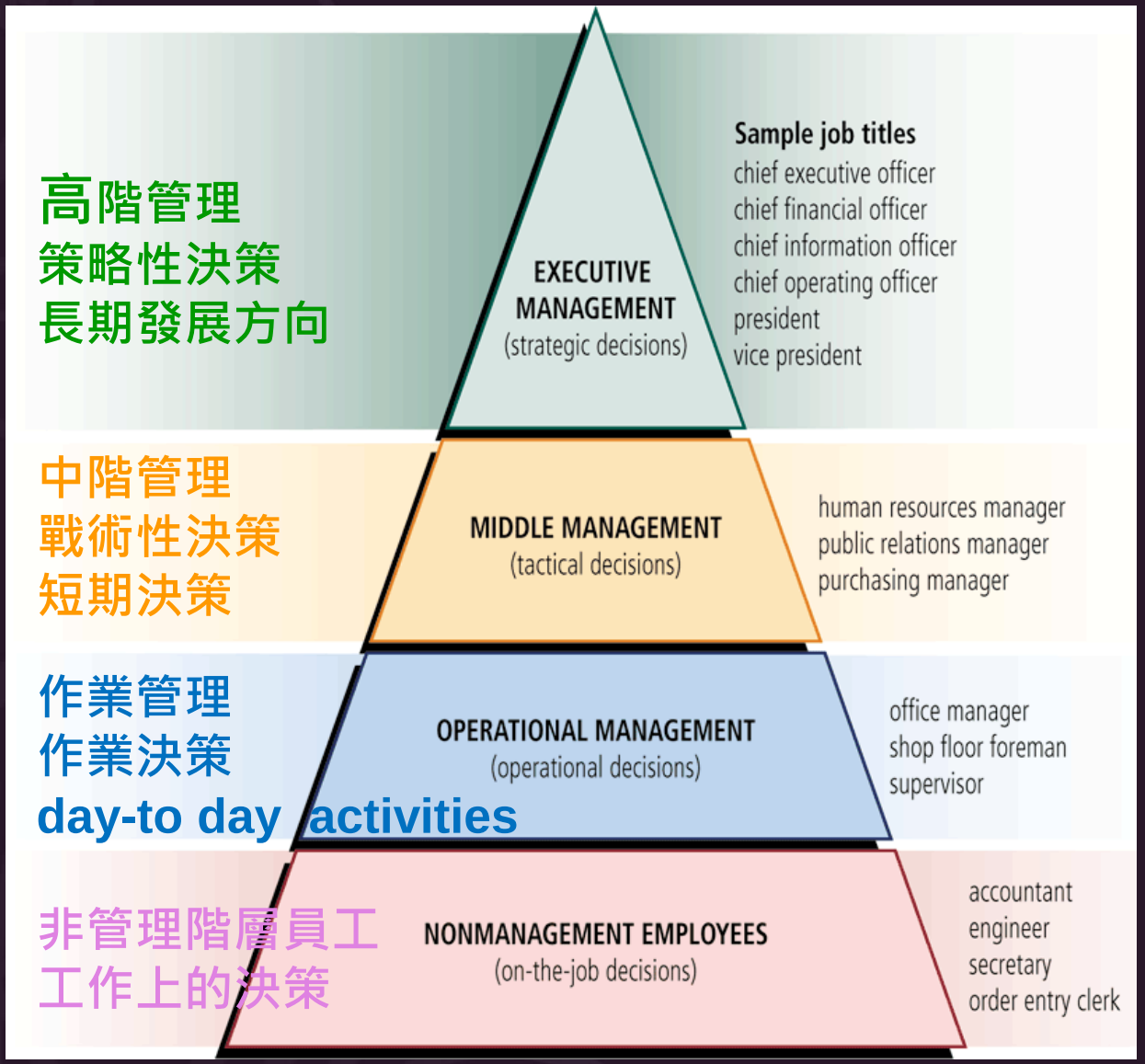
- Enterprise information is gathered in the ongoing operations of an enterprise-sized organization.
  企業資訊是指企業在運作過程中收集到的資訊
- Enterprise information begins with the day-to-day transactions that occur within an organization, such as sales receipts or time cards.
- The organization gathers and stores the information.
- Over time, employees collect, combine, and analyze the information.
- Ultimately, **the role of information gathered in this way is to allow managers to make better decisions.**

資訊系統分類

- The types of information that users require often **depend on their employee level** in the organization.
- In an enterprise, **users typically fall into one of four categories**
  - executive management
  - middle management
  - operational management
  - nonmanagement employees

組織管理層級與資訊系統

Supervise Others



Executive management

- Executive management, which includes the highest management positions in an organization, focuses on the long-range direction of the organization.
- These managers primarily are responsible for strategic decisions that center on the organization's overall goals and objectives.
- For example, in an airplane manufacturing company, executive management may decide when to design and build a new type of airplane.

Middle management

- Middle management is responsible for implementing the strategic decisions of executive management.
- Middle managers make tactical decisions, which are short-range decisions that apply specific programs and plans necessary to meet the stated objectives.
- Middle management oversees operational management.
- For example, in an airplane manufacturing company, middle management may decide from which vendor to purchase parts and whether to outsource some operations.

Operational management

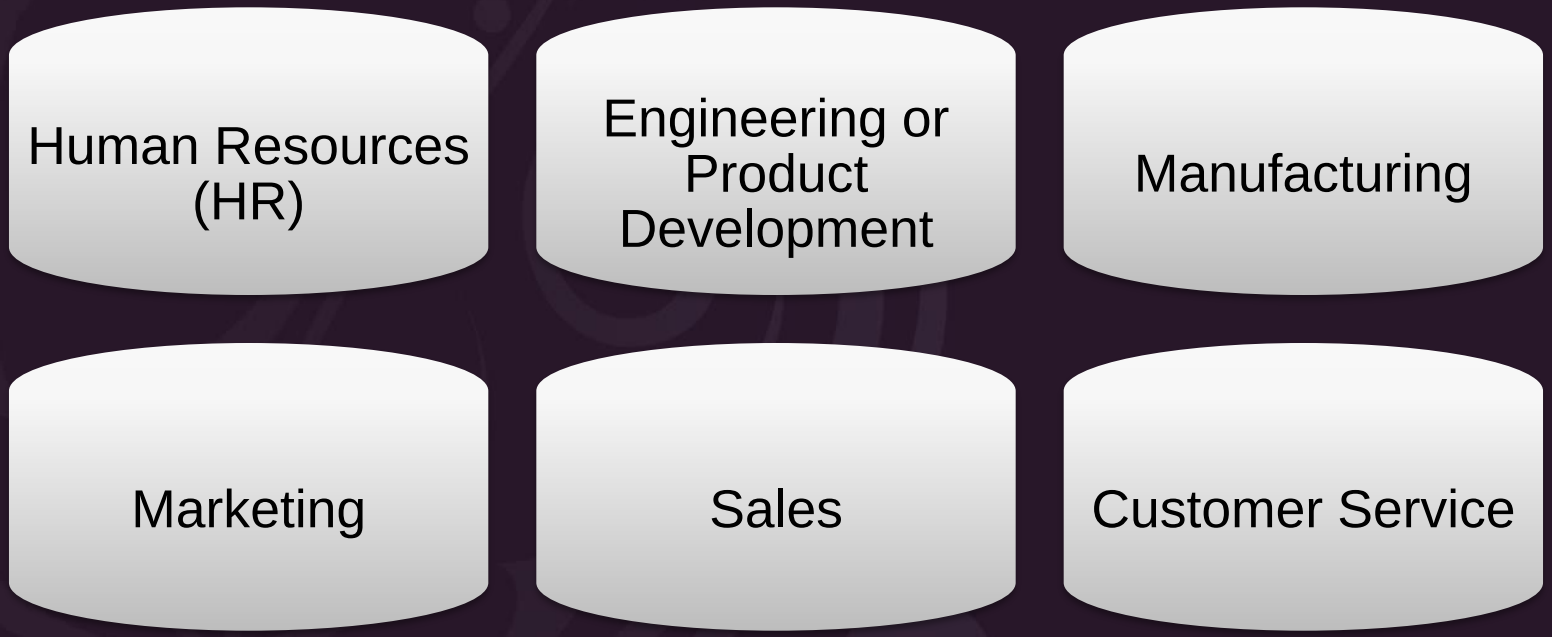
- Operational management supervises the production, clerical, and other nonmanagement employees of a company. In performing their duties, operational managers make numerous operational decisions.
- An operational decision involves day-to-day activities within the organization. These decisions should be consistent with and support the tactical decisions made by middle management.
- For example, in an airplane manufacturing company, operational management may decide the scheduling and process for building a new airplane.

Nonmanagement

- Nonmanagement employees include production, clerical, and other personnel.
- Nonmanagement employees frequently need information to perform their jobs. Today, these employees have more information available to them than in the past.
- For example, in an airplane manufacturing company, production employees may gather information regarding how to assemble a complex piece of equipment.
- They have access to the information necessary to make decisions that previously were made by managers — a trend called empowering users.

Information Systems in the Enterprise

- A typical enterprise consists of a wide variety of departments, centers, and divisions — collectively known as **functional units** 功能單位



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Information Systems in the Enterprise

- An information system supports daily, short-term, and long-range activities of users in a company.
- 有些資訊系統只有公司中某一個部門使用，有些資訊系統是公司中大部份的部門均可使用
- 整合性資訊系統由多個部門使用，可促進企業內部的信息共享和溝通。

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Table 12-1 Information Systems Used Exclusively by Functional Units in an Enterprise

Functional Unit	Information System
Human Resources (HR) 人力資源	• *A human resources information system* (*HRIS*) manages one or more administrative human resources functions, such as maintaining and managing employee benefits, schedules, and payroll.
Engineering or Product Development 工程與產品開發	• *Computer-aided engineering* (*CAE*) aids in the development and testing of product designs, and often includes CAD (computer-aided design).
Manufacturing 製造	• *Computer-aided manufacturing* (*CAM*) controls production equipment, such as drills, lathes, and milling machines. • *Material Requirements Planning* (*MRP*) monitors and controls inventory, material purchases, and other processes related to manufacturing operations. • *Manufacturing Resource Planning II* (*MRP II*) is an extension of MRP that also includes product packaging and shipping, machine scheduling, financial planning, demand forecasting, tracking labor productivity, and monitoring product quality.
Marketing 行銷	• Market research systems analyze data gathered from demographics and surveys.
Sales 銷售	• *Salesforce automation* (*SFA*) helps salespeople manage customer contacts, schedule customer meetings, log customer interactions, manage product information, and place customer orders.
Customer Service 客戶服務	• *Customer relationship management* (*CRM*) manages information about customers, past purchases, interests, and the day-to-day interactions, such as phone calls, email messages, web communications, and Internet messaging sessions.

Information Systems in the Enterprise

- A **human resources information system (HRIS)** manages one or more human resources functions
  人力資源資訊系統管理一個或多個人力資源功能

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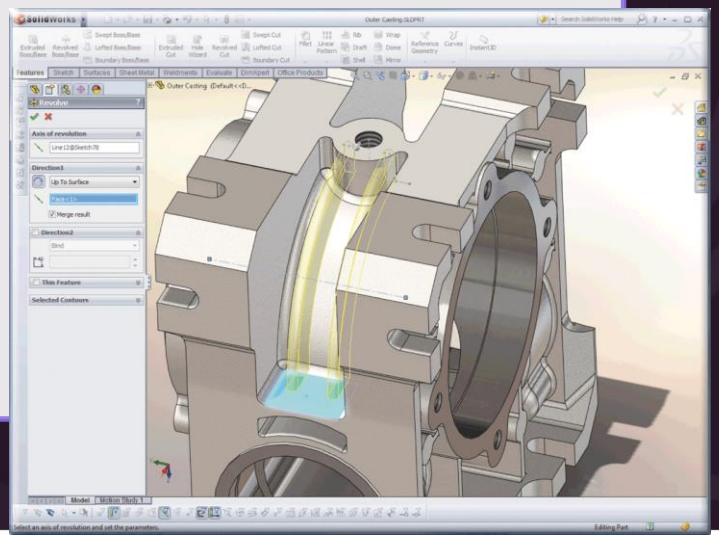
Engineering or Product Development

CAD電腦輔助設計

- Computer-aided design uses a computer and special software to aid in engineering, drafting, and design

  電腦輔助設計使用電腦和特殊的軟體輔助工程、打草稿、和設計



CAE電腦輔助工程

- Computer-aided engineering uses computers to test product designs

  電腦輔助工程使用電腦測試產品設計
- Create a **computer prototype** for use in testing under a variety of conditions.
- Engineers use **3-D visualization**, which allows them to interact with a product without **the need to build a prototype**.

Manufacturing

CAM 電腦輔助製造

- Computer-aided manufacturing (CAM) is the use of computers to control production equipment.
  電腦輔助製造是利用電腦控制生產設備

CIM 電腦整合製造

- Computer-integrated manufacturing (CIM) uses computers to integrate the many different operations of the manufacturing process, using technologies such as CAD, CAE, and CAM.
  電腦整合製造使用電腦整合許多製造過程中不同的操作

Information Systems in the Enterprise

- **Material Requirements Planning (MRP)**
  uses software to help monitor and control processes related to production
  物料需求規劃使用軟體幫忙監控與控制關於生產的過程
  - Focuses on issues related to inventory of parts and forecasting future demand so that materials needed for manufacturing can be on hand when they are needed.

物料需求規劃藉由主生產排程之展開來建立出一個排程以確認所需之零組件、原物料與所需之數量及此些零組件原物料的訂購時間，接收時間及完成作業時間。

MRP的目的**將正確的物料以正確的數量在正確的時間提供給正需要的地方**，用來**解答物料的三個基本問題：**

- **需求什麼？**
- **需要多少？**
- **何時需要？**

MRP系統基本上可分MRP的輸入部份，處理的過程及輸出三大部份。

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Information Systems in the Enterprise

- **Manufacturing Resource Planning II (MRP II)**
  is an extension of MRP and also includes software that helps in scheduling, tracking production in real time, and monitoring product quality.
  製造資源規劃MRPII是MRP的延伸，包含排程，即時追蹤生產與監督產品品質

- 由Wight於西元1981年推出，其乃從MRP發展出來並非取代傳統MRP，而是在生產規劃的同時，將著眼點擴展到人事、財務、行銷、管理等層面，融合各部門作業所需考量之實務需求，而非局限於單純之產銷供需，以使企業整體之運作能更加地有效率及制度化。

Pages 730

Marketing information system

- Marketing information system serve as a central repository for the tasks of a marketing function unit.
  行銷資訊系統作為提供行銷部門任務的中央資源庫
- Market research system
  - stores and analyzes data gathered from demographics and surveys.
  - Assists in target marketing by allowing marketing personnel to query databases based on criteria such as income, gender, previous purchases, and favorite recreational activities.

Information Systems in the Enterprise

- **Sales force automation (SFA)** help salespeople:
  - Manage customer contacts
  - Schedule customer meetings
  - Log customer interactions
  - Manage product information
  - Take orders from customers
  - Access up-to-date corporate information in real time
  - Upload information to central office
  - Download update product and pricing information

- SFA(**銷售自動化系統**)指的是支援及活用在「業務銷售領域」的資訊管理系統。其中重要目的在於業務流程進化(自動化)與促使業務活動效率化
- 包含主要功能：
  - 接觸管理(Contact Management)
  - 行程管理(Activity Management)
  - 通訊管理(Communication Management)
  - 銷售預測管理(Forecasting Management)
  - 銷售機會管理(Opportunity Management)
  - 訂單管理(Order Management)
  - 文件管理(Document Management)
  - 產品規劃(Product Configuration)
  - 市場百科全書(Marketing Encyclopedia)

Customer relationship management

- Customer relationship management 顧客關係管理 manages information about customers, interactions with customers, past purchases, and interests
  管理顧客的資訊、與顧客的互動、購買記錄，和興趣

Enterprise Resource Planning

- **Enterprise Resource Planning** (**ERP**) integrates MRP II with the **information flow** across an organization to manage and coordinate the ongoing activities of the enterprise, including **product planning**, **manufacturing and distribution**, **accounting and finance**, **sales, human resources, and customer support**.

  企業資源規劃提供集中式整合式的軟體，協助管理和協調企業各種持續進行的活動，包括製造、物流、會計、財務、銷售、產品規劃以及人力資源

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Advantages of ERP

- Advantages of ERP include complete integration of information systems across departments, better project management, and improved customer service.

  ERP的優點包括：可完全整合跨部門的資訊系統、較好的專案管理，以及改善客戶服務

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Advantages of ERP

- Complete integration means information is shared rapidly and management receives a more complete and timely view of the organization through the information.
  完全整合意指可快速分享資訊，透過資訊管理階層可能得到企業更完整且及時的瞭解
- Project management software often is standardized across an enterprise so that different parts of the enterprise easily can integrate and collaborate on their planning and logistics.
  專案管理軟體在全企業中標準化，所以各部門在規劃與後勤部份可容易整合與分工合作。

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ERP encompasses all of the major activities throughout an enterprise

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Figure 11-2

ERP

- The ERP system installed at each organization must be customized to match the business requirements of the enterprise.
- 對企業整體的經營資源作最有計劃、最有效率的應用
- ERP是一個大型模組化、**整合性**的流程導向系統，將企業營運所需的核心業務如銷售、庫存、採購、生產、物管、財務、會計、人事等流程整合在一起的資訊系統
- ERP提供即時化、多組織架構、跨公司財務整合、可隨組織變動彈性調整參數等諸多能力
- ERP能有效的協助企業管理存貨，降低採購成本，加速交貨速度，增進企業整體資金管理，快速提供決策資訊，提升企業的營運績效與快速反應能力

Document Management Systems

- A **document management system (DMS)** allows for storage and management of a company's documents
  文件管理系統提供公司的文件儲存與管理
  - The system supports access control, security, version tracking of documents, search capabilities, and the ability of users to check in and check out documents.
  - A central library, or **repository**, stored all documents within company or department

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Content Management Systems

- Enables and manages the publishing, modification, organization, and access of various forms of documents and other files
- Provides security controls
- Content added through a graphical user interface or webpage

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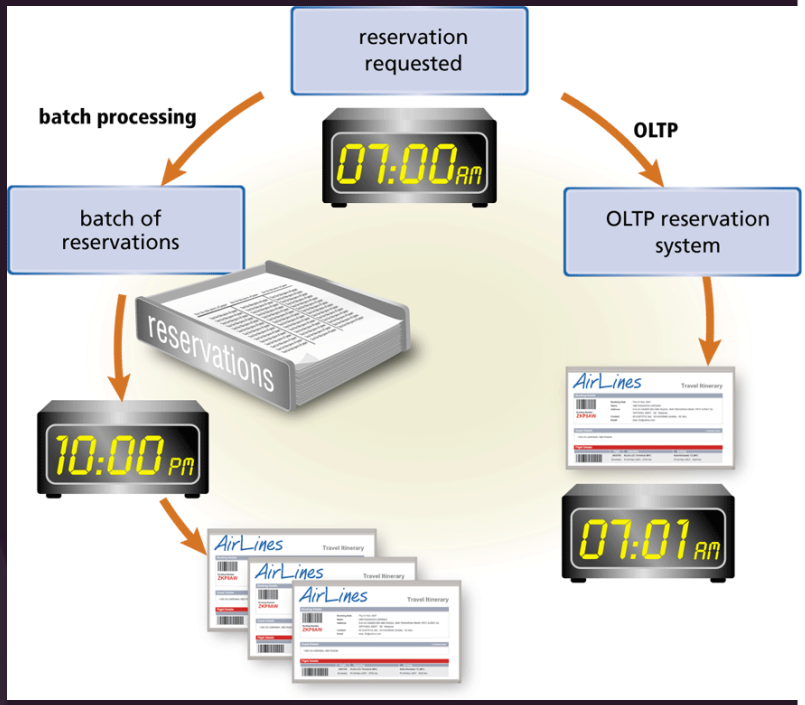
Information Systems in the Enterprise

- A **transaction processing system** (TPS) is an information system that captures and processes data from day-to-day business activities
  - Batch processing批次處理
    - The computer collects data over time and processes all transactions later as a group.
  - online transaction processing 線上交易處理
    - The computer process each transaction as it is entered.



For example, when you book a flight on the web, the airline probably uses OLTP to schedule the flight, book the flight, and send you a confirmation message

Pages 493 – 494
Figure 11-19

Information Systems in the Enterprise

- A **management information system** (**MIS**) is an information system that generates **accurate, timely, and organized information**, so that managers and other users can make decisions, solve problems, supervise activities, and track progress
- 將來自企業內部TPS的資訊，彙整成每年、每季、每月或每週的定期資訊及報表，然後提供給管理階層。

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Management information system

- A Management Information System create three basic types of reports
  - Detail report 詳細報表
  - Summary report 摘要報表
  - Exception report 例外報表

Detailed Flight Report for Flight #328

Passenger Name	Gender	Birthdate	Seat	Premier Club
Adams, Latisha	F	4/25/92	3C	Y
Brewer, Milton	M	10/14/45	22F	N
Cam, Lin	F	12/16/91	2A	Y
Canaan, Lana	F	4/12/90	21A	N
Cole, Kristina	F	5/10/79	16C	N
Drake, Louella	F	3/4/81	4A	Y
Galens, Lynette	F	11/2/75	2C	N
Gilbert, Laura	F	2/20/78	4F	N
Henreich, Max	M	3/10/85	17C	Y
Hidalgo, Ronald	M	10/15/44	3F	Y
Marsh, Constance	F	11/5/82	2C	N
McGill, Teresa	F	2/27/73	16F	Y
Moretti, Leo	M	9/22/90	17A	Y
Nitz, Dawn	F	7/12/65	3F	N
Ruiz, Albert	M	2/13/93	10D	Y
Stein, Michelle	F	8/16/50	3A	N
Tu, Benjamin	M	1/16/77	22C	N
Van Wijk, Fred	M	6/9/89	10A	Y
Warner, Betty	F	7/1/58	16A	N

Three basic types of reports generated in an Mis are detailed, summary, and exception.

Summary Flight Report for March 30

Flight #	Origin/ Destination	Passengers	Premier Club Members
1048	ORD – RSW	108	33
543	ORD – BMI	24	12
715	ORD – LAX	160	62
701	ORD – JFK	26	10

Exception Flight Report for March 30

Flight #	Class	Origin/ Destination	Premier Club Members	Premier Club Member Goal
1048	A	ORD – RSW	1	4
701	C	ORD – JFK	3	5

（細項報表）

管理資訊系統

航班細項報表（3月30日）

航班 #	起飛 / 目的地	艙等 乘客人數	尊榮 會員人數
1048	ORD – RSW	A – 5 B – 14 C – 89	A – 1 B – 12 C – 20
543	ORD – BMI	A – 2 B – 7 C – 15	A – 2 B – 5 C – 5
715	ORD – LAX	A – 12 B – 25 C – 123	A – 8 B – 15 C – 39
701	ORD – JFK	A – 9 B – 10 C – 7	A – 7 B – 0 C – 3

（摘要報表）

航班摘要報表（3月30日）

航班 #	起飛 / 目的地	乘客人數	尊榮 會員人數
1048	ORD – RSW	108	33
543	ORD – BMI	24	12
715	ORD – LAX	160	62
701	ORD – JFK	26	10

（例外報表）

航班例外報表（3月30日）

航班 #	艙等	起飛 / 目的地	尊榮會員 人數	尊榮會員 目標人數
1048	A	ORD – RSW	1	4
701	C	ORD – JFK	3	5

Decision Support systems (DSS)

- A **decision support system** (DSS) helps users analyze information and make decisions
  - Some decision support systems are company specific and designed solely for managers.
  - Others are available to everyone one the web. Sometimes are called Online analytical processing (OLAP)

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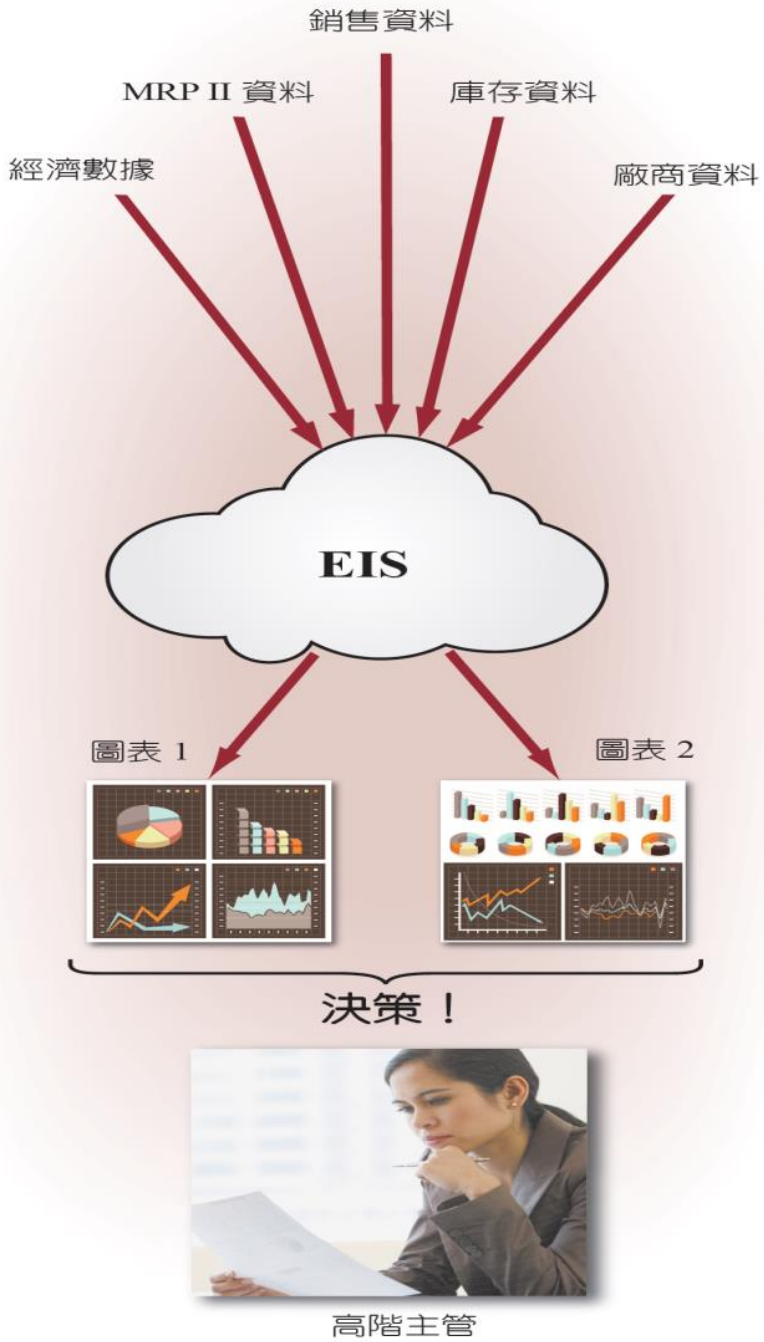
Figure 12-5

決策支援系統 (DSS)

- 決策支援系統 (DSS)
  - A decision support system uses data from **internal and external** sources.
  - Internal sources of data might include sales orders, MRP and MRP II results, inventory records, or financial data from accounting and financial analyses.
  - Data from external sources could include interest rates, population trends, costs of new housing construction or raw material pricing.

- 將來自企業內部MIS、TPS、EDP的資訊及外界環境的相關資訊，彙整成可供分析的資訊及報表，然後提供給管理階層。
- DSS彙整的資料與報表
  - 具分析能力，使用者只要更改假設，DSS會依據新假設做出評估
    - What -if


銷售資料
MRP II 資料
庫存資料
經濟數據
廠商資料
EIS
圖表 1
圖表 2
決策！
高階主管

Expert System專家系統

- An **expert system** is an information system that captures and stores the knowledge of human experts and then imitates human reasoning and decision making

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Figure 12-6

專家系統 (ES)

- 專家系統 (ES)
  - 讓電腦從蒐集豐富的資料庫中擷取資料，進而成為某個領域的專家。
  - 模仿專家的推理方式，針對特定領域提供建議或解答
  - 包含三個元件
    - 知識庫
      - 知識工程師與專家進行訪談
    - 推理引擎
    - 使用者介面