Case Study for Information Management

Foundations of Business Intelligence - Database and Information Management: Lego (Chap. 6)

1011CSIM4C06
TLMXB4C
Mon 8, 9, 10 (15:10-18:00) B602

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Assistant Professor

Dept. of Information Management, Tamkang University

http://mail.tku.edu.tw/myday/
2012-10-15
週次  日期   內容（Subject/Topics）
1  101/09/10  Introduction to Case Study for Information Management
2  101/09/17  Information Systems in Global Business:
               1. UPS, 2. The National Bank of Kuwait (Chap. 1)
3  101/09/24  Global E-Business and Collaboration:
               NTUC Income (Chap. 2)
4  101/10/01  Information Systems, Organization, and Strategy:
               Soundbuzz (Chap. 3)
5  101/10/08  IT Infrastructure and Emerging Technologies:
               Salesforce.com (Chap. 5)
6  101/10/15  Foundations of Business Intelligence: Lego (Chap. 6)
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Content</th>
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<tbody>
<tr>
<td>7</td>
<td>101/10/22</td>
<td>Telecommunications, the Internet, and Wireless Technology: Google, Apple, and Microsoft (Chap. 7)</td>
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<td>101/10/29</td>
<td>Securing Information System:</td>
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<td>2. European Network and Information Security Agency (ENISA) (Chap. 8)</td>
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<td>Midterm Report (期中報告)</td>
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<td>10</td>
<td>101/11/12</td>
<td>期中考試週</td>
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<td>1. Facebook, 2. Amazon vs. Walmart (Chap. 10)</td>
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<td>13</td>
<td>101/12/03</td>
<td>Knowledge Management: Tata Consulting Services (Chap. 11)</td>
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<td>14</td>
<td>101/12/10</td>
<td>Enhancing Decision Making: CompStat (Chap. 12)</td>
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<td>15</td>
<td>101/12/17</td>
<td>Building Information Systems: Electronic Medical Records (Chap. 13)</td>
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<td>16</td>
<td>101/12/24</td>
<td>Managing Projects: JetBlue and WestJet (Chap. 14)</td>
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<td>17</td>
<td>101/12/31</td>
<td>Final Report (期末報告)</td>
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<tr>
<td>18</td>
<td>102/01/07</td>
<td>期末考試週</td>
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Chap. 6
Foundations of Business Intelligence – Database and Information Management: Lego
Lego: Embracing Change by Combining BI with a Flexible Information System

1. Explain the role of the database in SAP's three-tier system.

2. Explain why distributed architectures are flexible.

3. Identify some of the business intelligence features included in SAP's business software suite.

4. What are the main advantages and disadvantages of having multiple databases in a distributed architecture? Explain.

THE DATA HIERARCHY

Student Database

Database

File

Record

Field

Byte

Bit

COURSE File

FINANCIAL File

PERSONAL File

COURSE

<table>
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<tr>
<th>Student_ID</th>
<th>Course</th>
<th>Date</th>
<th>Grade</th>
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Student Database

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</tr>
</tbody>
</table>

Field

IS 101  (Course field)

Byte

0100 1001  (Letter I in ASCII)

Bit

0

TRADITIONAL FILE PROCESSING

ACCOUNTING AND FINANCE: Users → Application program 1 → A B C D

HUMAN RESOURCES: Users → Application program 2 → A B D E

SALES AND MARKETING: Users → Application program 3 → A B E G

MANUFACTURING: Users → Application program 4 → A E F G

Master file: Data elements A to Z

Derivative files

HUMAN RESOURCES DATABASE WITH MULTIPLE VIEWS

Human Resources Database

- Employee_ID
- Name
- SSN
- Position
- Date_Hired
- Gross_Pay
- Net_Pay
- Life_Insurance
- Pension_Benefit
- Health_Care

Database Management System

Benefits View

- Name
- SSN
- Health_Care

Payroll View

- Name
- SSN
- Gross_Pay
- Net_Pay

# RELATIONAL DATABASE TABLES

## SUPPLIER

<table>
<thead>
<tr>
<th>Supplier_Number</th>
<th>Supplier_Name</th>
<th>Supplier_Street</th>
<th>Supplier_City</th>
<th>Supplier_State</th>
<th>Supplier_Zip</th>
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</thead>
<tbody>
<tr>
<td>8259</td>
<td>CBM Inc.</td>
<td>74 5th Avenue</td>
<td>Dayton</td>
<td>OH</td>
<td>45220</td>
</tr>
<tr>
<td>8261</td>
<td>B. R. Molds</td>
<td>1277 Gandolly Street</td>
<td>Cleveland</td>
<td>OH</td>
<td>49345</td>
</tr>
<tr>
<td>8263</td>
<td>Jackson Composites</td>
<td>8233 Micklin Street</td>
<td>Lexington</td>
<td>KY</td>
<td>56723</td>
</tr>
<tr>
<td>8444</td>
<td>Bryant Corporation</td>
<td>4315 Mill Drive</td>
<td>Rochester</td>
<td>NY</td>
<td>11344</td>
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**Key Field (Primary Key):**

**Columns (Attributes, Fields):**

**Rows (Records, Tuples):**

RELATIONAL DATABASE TABLES
(cont.)

**PART**

<table>
<thead>
<tr>
<th>Part_Number</th>
<th>Part_Name</th>
<th>Unit_Price</th>
<th>Supplier_Number</th>
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<tbody>
<tr>
<td>137</td>
<td>Door latch</td>
<td>22.00</td>
<td>8259</td>
</tr>
<tr>
<td>145</td>
<td>Side mirror</td>
<td>12.00</td>
<td>8444</td>
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<tr>
<td>150</td>
<td>Door molding</td>
<td>6.00</td>
<td>8263</td>
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<tr>
<td>152</td>
<td>Door lock</td>
<td>31.00</td>
<td>8259</td>
</tr>
<tr>
<td>155</td>
<td>Compressor</td>
<td>54.00</td>
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<tr>
<td>178</td>
<td>Door handle</td>
<td>10.00</td>
<td>8259</td>
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</tbody>
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THE THREE BASIC OPERATIONS OF A RELATIONAL DBMS

PART

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<td>Door handle</td>
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</table>

Select Part_Number = 137 or 150

SUPPLIER

<table>
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<tr>
<th>Supplier_Number</th>
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Join by Supplier_Number

<table>
<thead>
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<th>Supplier_Number</th>
<th>Supplier_Name</th>
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<td>Jackson Components</td>
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</tbody>
</table>

Project selected columns

AN UNNORMALIZED RELATION FOR ORDER

ORDER (Before Normalization)

- Order_Number
- Order_Date
- Part_Number
- Part_Name
- Unit_Price
- Part_Quantity
- Supplier_Number
- Supplier_Name
- Supplier_Street
- Supplier_City
- Supplier_State
- Supplier_Zip

NORMALIZED TABLES CREATED FROM ORDER

PART
- Part_Number
- Part_Name
- Unit_Price
- Supplier_Number

Key

SUPPLIER
- Supplier_Number
- Supplier_Name
- Supplier_Street
- Supplier_City
- Supplier_State
- Supplier_Zip

Key

LINE_ITEM
- Order_Number
- Part_Number
- Part_Quantity

Key

ORDER
- Order_Number
- Order_Date

Key

COMPONENTS OF A DATA WAREHOUSE

INTERNAL DATA SOURCES
- Operational Data
- Customer Data
- Manufacturing Data
- Historical Data

EXTERNAL DATA SOURCES
- External Data

Extract and Transform

Data Warehouse

Data Access and Analysis
- Queries and reports
- OLAP
- Data mining

Information Directory

Data Warehouse vs. Data Marts

• Data warehouse:
  – Stores current and historical data from many core operational transaction systems
  – Consolidates and standardizes information for use across enterprise, but data cannot be altered
  – Data warehouse system will provide query, analysis, and reporting tools

• Data marts:
  – Subset of data warehouse
  – Summarized or highly focused portion of firm’s data for use by specific population of users
  – Typically focuses on single subject or line of business
Business Intelligence (BI)

• Tools for consolidating, analyzing, and providing access to vast amounts of data to help users make better business decisions
  – E.g., Harrah’s Entertainment analyzes customers to develop gambling profiles and identify most profitable customers
• Principle tools include:
  – Software for database query and reporting
  – Online analytical processing (OLAP)
  – Data mining

Online analytical processing (OLAP)

- Supports multidimensional data analysis
  - Viewing data using multiple dimensions
  - Each aspect of information (product, pricing, cost, region, time period) is different dimension
  - E.g., how many washers sold in the East in June compared with other regions?

- OLAP enables rapid, online answers to ad hoc queries

MULTIDIMENSIONAL DATA MODEL

Data Mining

• More discovery driven than OLAP
• Finds hidden patterns, relationships in large databases and infers rules to predict future behavior
  – E.g., Finding patterns in customer data for one-to-one marketing campaigns or to identify profitable customers.
• Types of information obtainable from data mining
  – Associations
  – Sequences
  – Classification
  – Clustering
  – Forecasting

Predictive analysis

• Uses data mining techniques, historical data, and assumptions about future conditions to predict outcomes of events

• E.g., Probability a customer will respond to an offer

Text Mining

- **Text mining (text data mining)**
  - the process of deriving high-quality information from text
  - Extracts key elements from large unstructured data sets (e.g., stored e-mails)

- **Typical text mining tasks**
  - text categorization
  - text clustering
  - concept/entity extraction
  - production of granular taxonomies
  - sentiment analysis
  - document summarization
  - entity relation modeling

Web Mining

• Discovery and analysis of useful patterns and information from WWW
  – E.g., to understand customer behavior, evaluate effectiveness of Web site, etc.

• 3 Tasks of Web Mining
  – Web content mining
    • Knowledge extracted from content of Web pages
  – Web structure mining
    • E.g., links to and from Web page
  – Web usage mining
    • User interaction data recorded by Web server

Web Mining

- Web mining (or Web data mining) is the process of discovering intrinsic relationships from Web data (textual, linkage, or usage)

Web Content Mining
Source: unstructured textual content of the Web pages (usually in HTML format)

Web Structure Mining
Source: the unified resource locator (URL) links contained in the Web pages

Web Usage Mining
Source: the detailed description of a Web site’s visits (sequence of clicks by sessions)

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems
LINKING INTERNAL DATABASES TO THE WEB

資訊管理個案
(Case Study for Information Management)

1. 請同學於資訊管理個案討論前應詳細研讀個案，並思考個案研究問題。
2. 請同學於上課前複習相關資訊管理相關理論，以作為個案分析及擬定管理對策的依據。
3. 請同學於上課前先繳交個案研究問題書面報告。
References

- 周宣光 譯 (2011)，資訊管理系統－管理數位化公司，第12版，東華書局