Case Study for Information Management

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

Min-Yuh Day
Assistant Professor
Dept. of Information Management, Tamkang University

http://mail.tku.edu.tw/myday/
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週次 日期 內容（Subject/Topics）
1  101/09/13  Introduction to Case Study for Information Management
2  101/09/20  Information Systems in Global Business: 
                     1. UPS, 2. The National Bank of Kuwait (Chap. 1)
3  101/09/27  Global E-Business and Collaboration: 
                 NTUC Income (Chap. 2)
4  101/10/04  Information Systems, Organization, and Strategy: 
                 Soundbuzz (Chap. 3)
5  101/10/11  IT Infrastructure and Emerging Technologies: 
                 Salesforce.com (Chap. 5)
6  101/10/18  Foundations of Business Intelligence: Lego (Chap. 6)
課程大綱 (Syllabus)

週次 日期 內容（Subject/Topics）
7 101/10/25 Telecommunications, the Internet, and Wireless Technology: Google, Apple, and Microsoft (Chap. 7)
8 101/11/01 Securing Information System:
   1. Facebook,
   2. European Network and Information Security Agency (ENISA) (Chap. 8)
9 101/11/08 Midterm Report (期中報告)
10 101/11/15 期中考試週
11 101/11/22 Enterprise Application:
   Border States Industries Inc. (BSE) (Chap. 9)
12 101/11/29 E-commerce:
   1. Facebook, 2. Amazon vs. Walmart (Chap. 10)
<table>
<thead>
<tr>
<th>週次</th>
<th>日期</th>
<th>内容（Subject/Topics）</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>101/12/06</td>
<td>Knowledge Management: Tata Consulting Services (Chap. 11)</td>
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<tr>
<td>14</td>
<td>101/12/13</td>
<td>Enhancing Decision Making: CompStat (Chap. 12)</td>
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<td>15</td>
<td>101/12/20</td>
<td>Building Information Systems: Electronic Medical Records (Chap. 13)</td>
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<tr>
<td>16</td>
<td>101/12/27</td>
<td>Managing Projects: JetBlue and WestJet (Chap. 14)</td>
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<tr>
<td>18</td>
<td>102/01/10</td>
<td>期末考试週</td>
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Chap. 6
Foundations of Business Intelligence – Database and Information Management: Lego
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

- COURSE File
- FINANCIAL File
- PERSONAL File

COURSE

<table>
<thead>
<tr>
<th>Student_ID</th>
<th>Course</th>
<th>Date</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>39044</td>
<td>IS 101</td>
<td>F06</td>
<td>B+</td>
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<td>59432</td>
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<td>64029</td>
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Student ID

<table>
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<tr>
<td>39044</td>
<td>IS 101</td>
<td>F06</td>
<td>B+</td>
</tr>
</tbody>
</table>

Course field

- IS 101

Letter in ASCII

- 0100 1001

TRADITIONAL FILE PROCESSING

HUMAN RESOURCES DATABASE
WITH MULTIPLE VIEWS

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

The diagram illustrates a relational database table with columns and rows. Here is the data in a tabular format:

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

Key Field (Primary Key)

## RELATIONAL DATABASE TABLES (cont.)

### PART

<table>
<thead>
<tr>
<th>Part_Number</th>
<th>Part_Name</th>
<th>Unit_Price</th>
<th>Supplier_Number</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>150</td>
<td>Door molding</td>
<td>6.00</td>
<td>8263</td>
</tr>
<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>
<td>8261</td>
</tr>
<tr>
<td>178</td>
<td>Door handle</td>
<td>10.00</td>
<td>8259</td>
</tr>
</tbody>
</table>

Primary Key

Foreign Key

THE THREE BASIC OPERATIONS OF A RELATIONAL DBMS

1. Select Part_Number = 137 or 150

2. Project selected columns

3. Join by Supplier_Number
AN UNNORMALIZED RELATION FOR ORDER

<table>
<thead>
<tr>
<th>Order_Number</th>
<th>Order_Date</th>
<th>Part_Number</th>
<th>Part_Name</th>
<th>Unit_Price</th>
<th>Part_Quantity</th>
<th>Supplier_Number</th>
<th>Supplier_Name</th>
<th>Supplier_Street</th>
<th>Supplier_City</th>
<th>Supplier_State</th>
<th>Supplier_Zip</th>
</tr>
</thead>
</table>

ORDER (Before Normalization)

NORMALIZED TABLES CREATED FROM ORDER

AN ENTITY-RELATIONSHIP DIAGRAM

COMPONENTS OF A DATA WAREHOUSE

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

EXTERNAL DATA SOURCES
- External Data

Data Warehouse
- Extract and Transform

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)

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