

KECERDASAN BISNIS (KB)

- Sifat dan sumber data
- Pengumpulan data , masalah dan kualitas
- Web / internet dan layanan database komersial
- Data warehousing
- Data marts
- Kecerdasan bisnis/ analitik bisnis
- Pemrosesan analitik online (OLAP)
- Data mining
- Visualisasi data, multidimensional dan analitik real-time

Referensi lihat SAP : [5] Bab 5,
[7] Chapter 4

The Nature and Sources of Data

- Data: Raw
- Information: Data organized to convey meaning
- Knowledge: Data items organized and processed to convey understanding, experience, accumulated learning, and expertise

Data Sources

- Internal
- External
- Personal

DSS Data Items

- Documents
- Pictures
- Maps
- Sound
- Animation
- Video

- Can be hard or soft

Data Collection, Problems, and Quality

- Problems (Table 4.1)

- Quality: determines usefulness of data
 - Intrinsic data quality
 - Accessibility data quality
 - Representation data quality

Data Quality Issues in Data Warehousing

- Uniformity
- Version
- Completeness check
- Conformity check
- Genealogy check (drill down)

Use *Web Browsers* to

- Access vital information by employees and customers
- Implement executive information systems
- Implement group support systems (GSS)
- Database management systems provide data in HTML, on Web servers directly

The Internet and Commercial Database Services

For external data

- *The Internet*: major supplier of external data
- *Commercial Data Banks*: sell access to specialized databases

Can add external data to the MSS in a timely manner and at a reasonable cost

Data Warehousing (DW)

- Physical separation of operational and decision support environments
- Purpose: to establish a *data repository* making operational data accessible
- Transforms operational data to relational form
- Only data needed for decision support come from the TPS
- Data are transformed and integrated into a consistent structure
- Data warehousing (information warehousing): solves the data access problem
- End users perform ad hoc query, reporting analysis and visualization

DW Benefits

- Increase in knowledge worker productivity
- Supports all decision makers' data requirements
- Provide ready access to critical data
- Insulates operation databases from ad hoc processing
- Provides high-level summary information
- Provides drill down capabilities

Yields

- Improved business knowledge
- Competitive advantage
- Enhances customer service and satisfaction
- Facilitates decision making
- Help streamline business processes

Characteristics of DW

1. Data organized by detailed subject with information relevant for decision support
2. Integrated data
3. Time-variant data
4. Non-volatile data

DW Architecture and Process

- Two-tier architecture
- Three-tier architecture

DW Components

- Large physical database
- Logical data warehouse
- Data mart
- Decision support systems (DSS) and executive information system (EIS)

- Can feed OLAP

DW Suitability

For organizations where

- Data are in different systems
- Information-based approach to management in use
- Large, diverse customer base
- Same data have different representations in different systems
- Highly technical, messy data formats

OLAP: Data Access and Mining, Querying, and Analysis

Online analytical processing (OLAP)

- DSS and EIS computing done by end-users in online systems
- Versus online transaction processing (OLTP)

OLAP Activities

- Generating queries
- Requesting ad hoc reports
- Conducting statistical and other analyses
- Developing multimedia applications

OLAP uses the data warehouse and a *set of tools*, usually with multidimensional capabilities

- Query tools
- Spreadsheets
- Data mining tools
- Data visualization tools

Using SQL for Querying

- SQL (Structured Query Language)
Data language
English-like, nonprocedural, very user friendly language
Free format

Example:

```
SELECT          Name, Salary
FROM            Employees
WHERE           Salary >2000
```

Data Mining (DM) for

- Knowledge discovery in databases
- Knowledge extraction
- Data archeology
- Data exploration
- Data pattern processing
- Data dredging
- Information harvesting

Major DM Characteristics and Objectives

- Data are often buried deep
- Client/server architecture
- Sophisticated new tools--including advanced visualization tools--help to remove the information “ore”
- End-user miner empowered by data drills and other power query tools with little or no programming skills
- Often involves finding unexpected results
- Tools are easily combined with spreadsheets, etc.
- Parallel processing for data mining

DM Application Areas

- Marketing
- Banking
- Retailing and sales
- Manufacturing and production
- Brokerage and securities trading
- Insurance
- Computer hardware and software
- Government and defense
- Airlines
- Health care
- Broadcasting
- Law enforcement

Intelligent Data Mining

- Use intelligent search to discover information within data warehouses that queries and reports cannot effectively reveal
- Find patterns in the data and infer rules from them
- Use patterns and rules to guide decision making and forecasting
- Five common types of information that can be yielded by data mining: 1) association, 2) sequences, 3) classifications, 4) clusters, and 5) forecasting

Main Tools Used in Intelligent Data Mining

- Case-based Reasoning
- Neural Computing
- Intelligent Agents
- Other Tools
 - Decision trees
 - Rule induction
 - Data visualization

Data Visualization and Multidimensionality

Data Visualization Technologies

- Digital images
- Geographic information systems
- Graphical user interfaces
- Multidimensions
- Tables and graphs
- Virtual reality
- Presentations
- Animation

Multidimensionality

- 3-D + Spreadsheets (OLAP has this)
- Data can be organized the way managers like to see them, rather than the way that the system analysts do
- Different presentations of the *same data* can be arranged easily and quickly
- *Dimensions*: products, salespeople, market segments, business units, geographical locations, distribution channels, country, or industry
- *Measures*: money, sales volume, head count, inventory profit, actual versus forecast
- *Time*: daily, weekly, monthly, quarterly, or yearly

Multidimensionality Limitations

- Extra storage requirements
- Higher cost
- Extra system resource and time consumption
- More complex interfaces and maintenance

Multidimensionality is especially popular in executive information and support systems

Geographic Information Systems (GIS)

- A computer-based system for capturing, storing, checking, integrating, manipulating, and displaying data using digitized maps
- Spatially-oriented databases
- Useful in marketing, sales, voting estimation, planned product distribution
- Available via the Web
- Can use with GPS

Virtual Reality

- An environment and/or technology that provides artificially generated sensory cues sufficient to engender in the user some willing suspension of disbelief
- Can share data and interact
- Can analyze data by creating a landscape
- Useful in marketing, prototyping aircraft designs
- VR over the Internet through VRML

Ringkasan

- Data for decision making come from internal and external sources
- The database management system is one of the major components of most management support systems
- Familiarity with the latest developments is critical
- Data contain a gold mine of information if they can dig it out
- Organizations are warehousing and mining data
- Multidimensional analysis tools and new enterprise-wide system architectures are useful
- OLAP tools are also useful
- New data formats for multimedia DBMS
- Internet and intranets via Web browser interfaces for DBMS access
- Built-in artificial intelligence methods in DBMS