

Chapter 3



Data Management: Data, Databases and Warehousing

Information Technology For Management 6th Edition

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John Wiley & Sons, Inc.

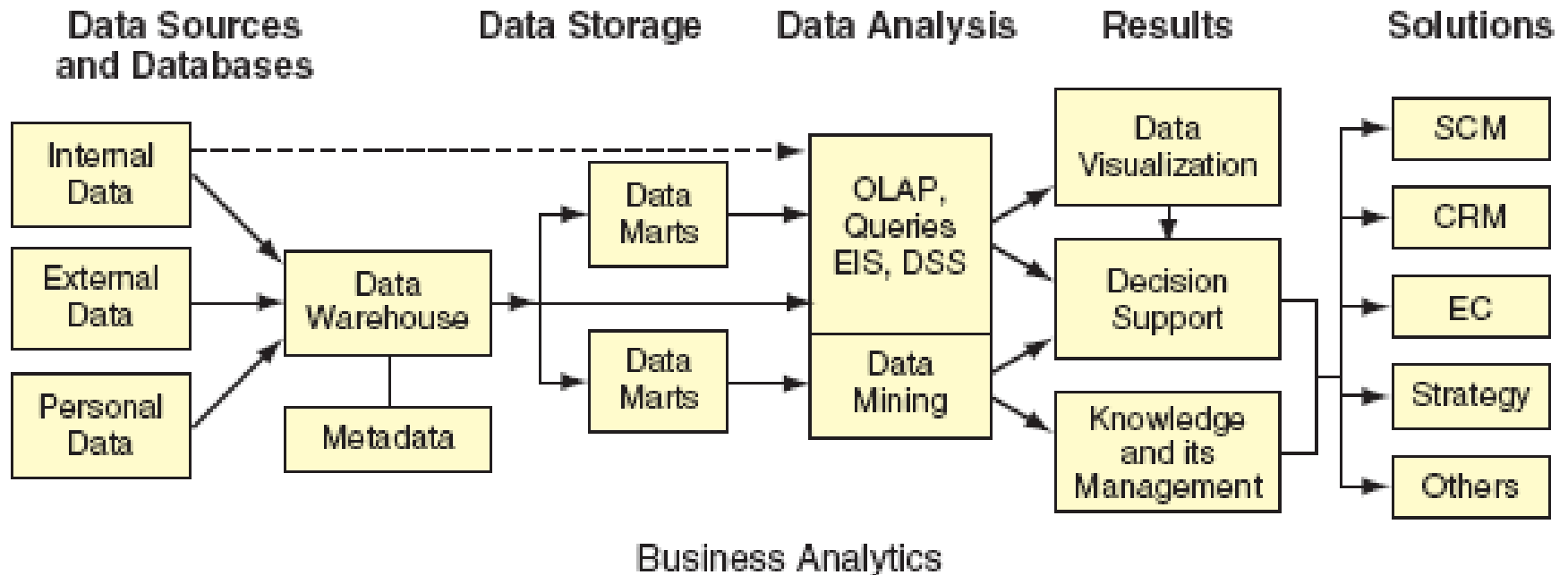
Learning Objectives

- Recognize the importance of data, managerial issues, and life cycle
- Describe sources of data, collection, and quality
- Describe DMS
- Describe Data Warehousing and Analytical Processing
- Describe DBMS (benefits and issues)

Learning Objectives (Continued)

- Understand conceptual, logical, and physical data
- Understand ERD
- The importance of Marketing
- The Internet and Data Management

Data Life Cycle Process



Data Management : A Critical Success Factor

- Corporate data are key strategic assets and so managing data quality is vital to organization.
- Dirty data can result in poor business decisions, poor customer service and inadequate product design
- The foundation of data management has four building blocks :
 - Data profiling – understanding the data
 - Data quality management – improving the quality of data
 - Data integration – combining similar data from multiple sources
 - Data augmentation – improving the value of the data

Data Problems and Difficulties

- The amount of data increases exponentially with time
- Data are scattered throughout organizations and are collected by many individuals using several methods and devices.
- Data security, quality, integrity and validity
- Data redundant and often out-of-date

Solutions To Managing Data

- Organizing data in a **hierarchical format** in one location
- **Relational database** based on organization of data in rows and columns, were added to facilitate end-user computing and decision support.
- Improving data management with **Datawarehouse** (impact of client server, concurrency, web technology)

Transactional vs. Analytical Data Processing

- **Transactional processing** takes place in **operational systems (TPS)** that provide the organization with the capability to perform business transactions and produce transaction reports. The data are organized mainly in a *hierarchical structure* and are centrally processed. This is done primarily for fast and efficient processing of routine, repetitive data.
- Supplementary activity to transaction processing is called **analytical processing**, which involves the analysis of accumulated data. Analytical processing, sometimes referred to as *business intelligence*, includes **data mining, decision support systems (DSS), querying**, and other analysis activities. These analyses place strategic information in the hands of decision makers to enhance productivity and make better decisions, leading to greater competitive advantage.

Data Problems and Possible Solutions

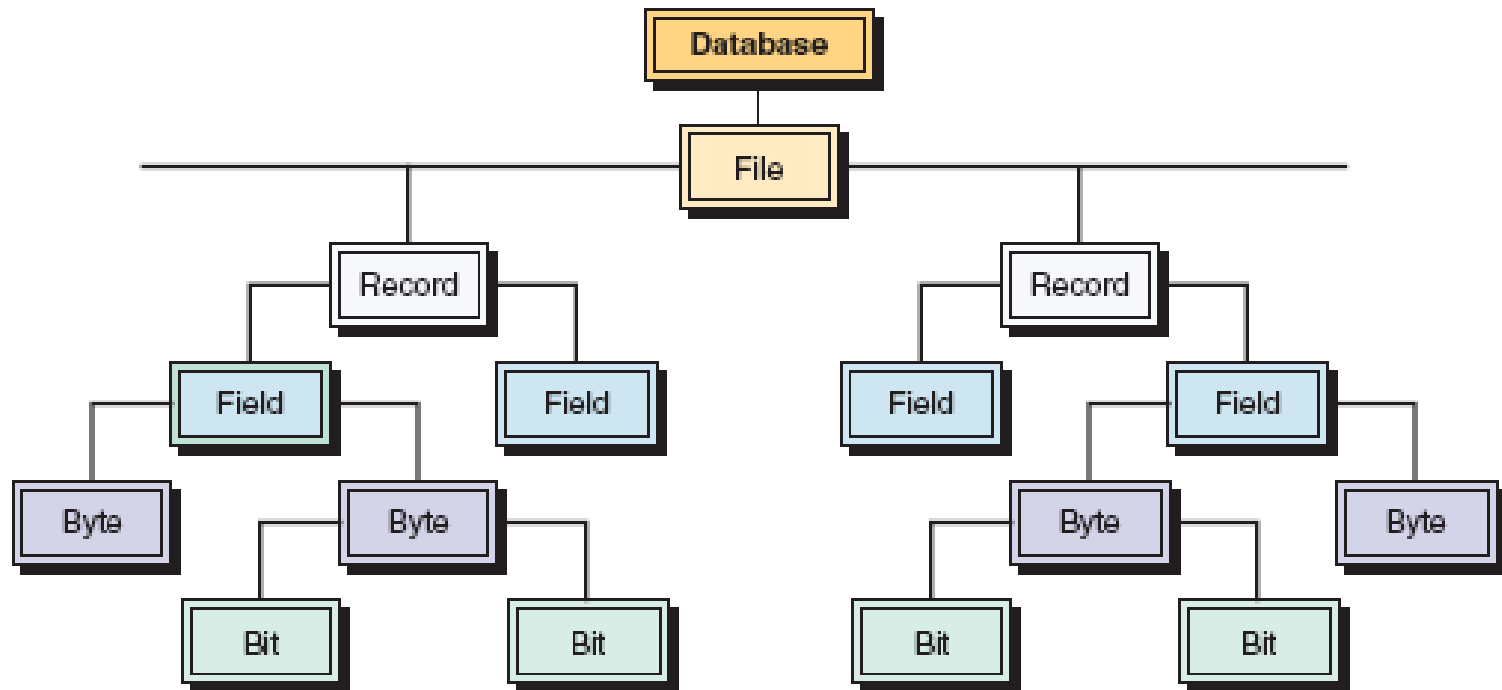
Problems	Typical Cause	Possible Solutions
Incorrect data	Bad data Entry	Automated data entry, scanning systems for data entry, web forms for individuals entering data with drop-down menu and radio button
Redundant data	Poor database design	Redesign the data model, normalize the relational database
Stolen data	Poor security	Take appropriate security measures
Irrelevant data	Wrong data collected	Collect data that are appropriate for the task and avoid related data that are not relevant
Missing data	Required data Never existed	Generate and enter data needed for use

Document Management



- The automated control of electronic documents, page images, spreadsheets, voice word processing documents and other complex document through their entire life cycle within an organization, from initial creation to final archiving.
- The major tools of document management are workflow software, authoring tools, scanners, and databases.
- Document management System (DMS) provide decision makers with information in an electronic format and usually include computerized imaging system that can result in substantial savings.

Hierarchy of Data



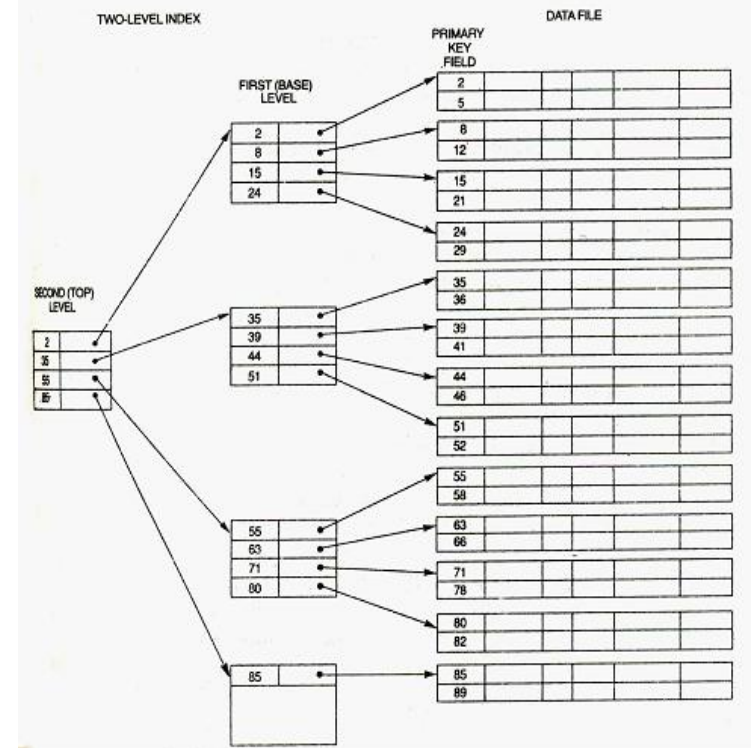
File management



- Bit
- Byte
- Field
- Record (attribute)
- File
- Database
 - Primary key, Secondary keys, Foreign key

Accessing Records Form Computer Files

- Sequential File Org.
 - Data record must be retrieved in the same physical sequence in which they are stored
 - Index sequential access method
- Direct or random File Org.
 - User can retrieve records in any sequence, without regard to actual physical order on the storage medium
 - Direct file access method



Problems Of Management File System



- Data Redundancy
- Data Inconsistency
- Data Isolation
- Data integrity

Databases



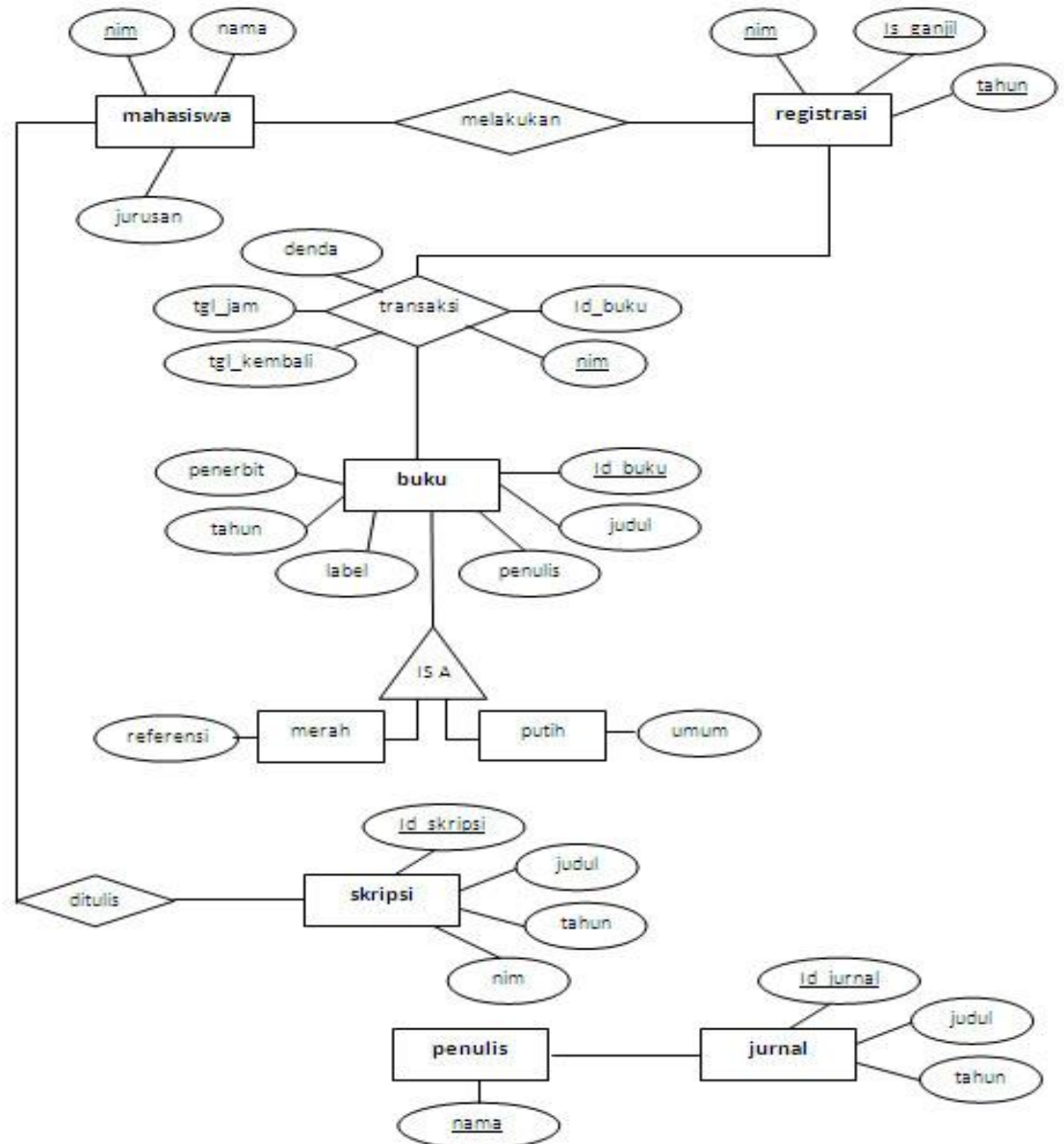
- A Database is an organized logical grouping of related files.
- Type of Database :
 - Centralized Database
 - Distributed Database
 - Replicated Database
 - Partioned database

Database Management System (DBMS)

- The programs that provides access to database
- Advatages and capabilities of DBMS
 - Persistence
 - Query ability
 - Concurrency
 - Backup and replication
 - Rule enforcement
 - Security
 - Computation
 - Change and access logging
 - Automated optimization

Forms for Modeling Data (ERD)

- Entities
- Attributes
- Relations



Hierarchy of Data (cont'd)

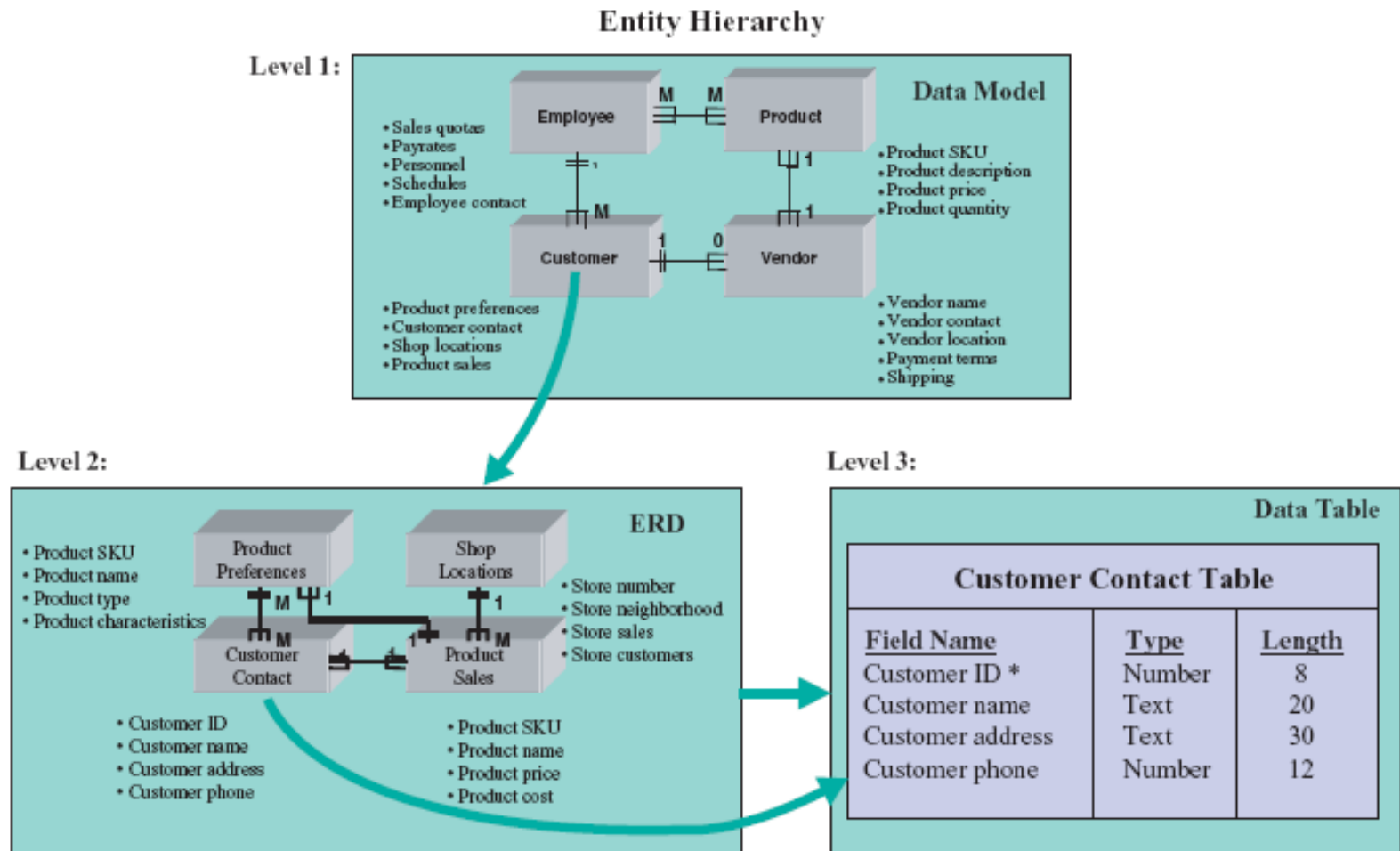
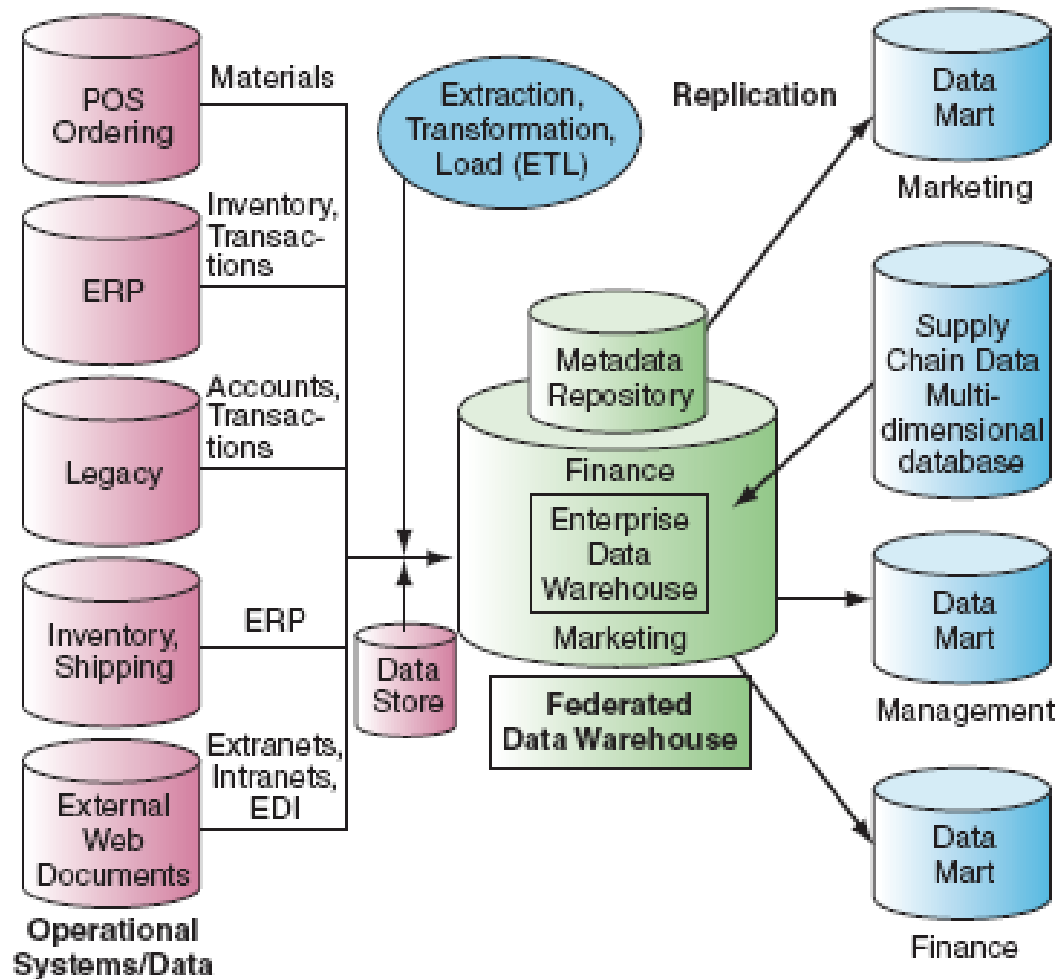


Figure 3.12 Data modeling. (Source: Drawn by Donald Amoroso.)

The Data Warehouse & Data Management



Web-based Data Management Systems – content and information

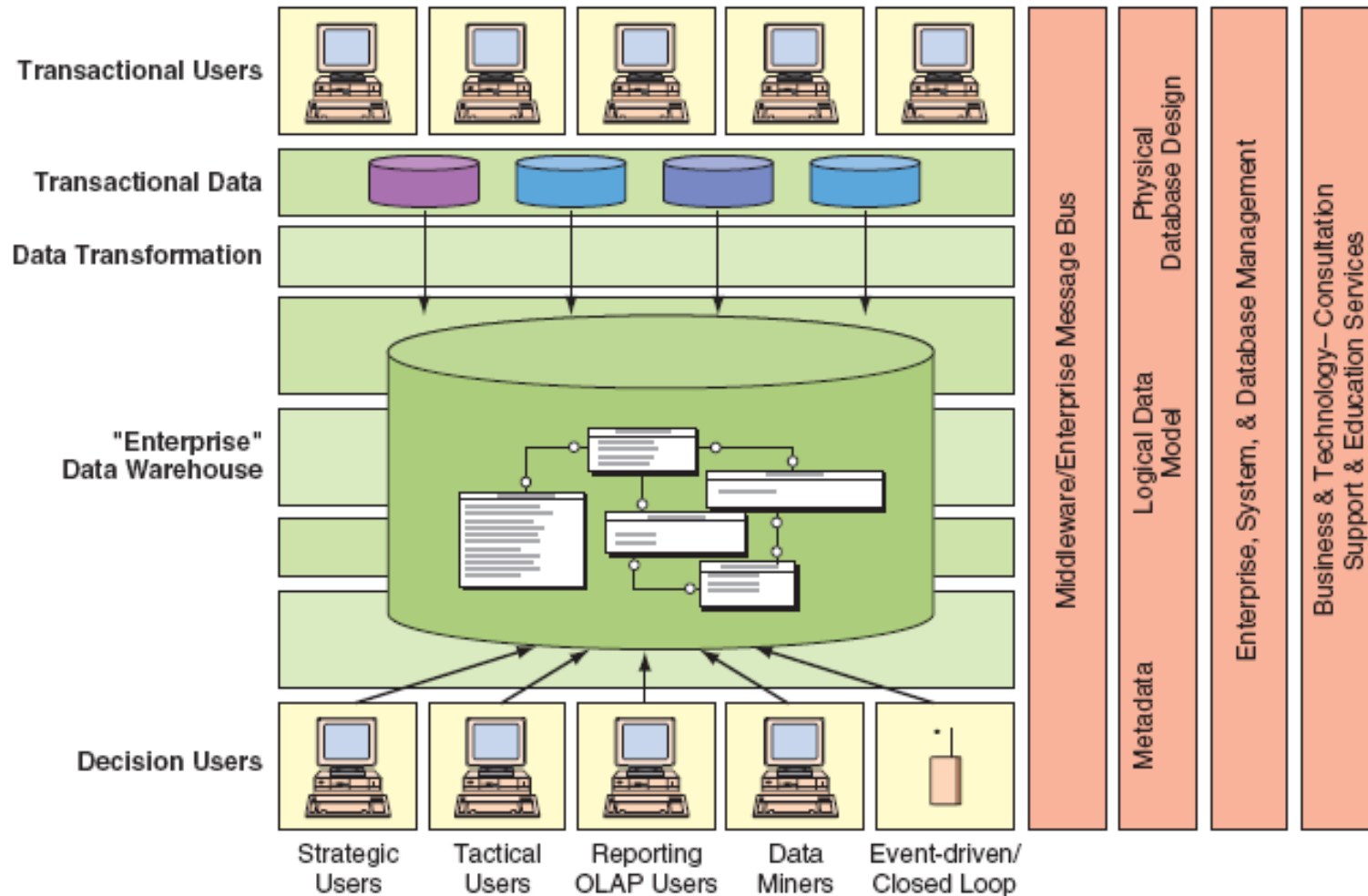


Figure 3.14 Teradata Corp.'s enterprise data warehouse. (Source: Teradata Corporation [teradata.com], with permission.)

Managerial Issues

- Cost-benefit issues and justification
- Where to store data physically
- Legal issues
- Internal or external?
- Data Delivery

Managerial Issues (Continued)

- Disaster recovery
- Data security and ethics
- Ethics: Paying for use of data
- Privacy
- Legacy Data

Chapter 3



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