

Database Management Systems



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Introduction

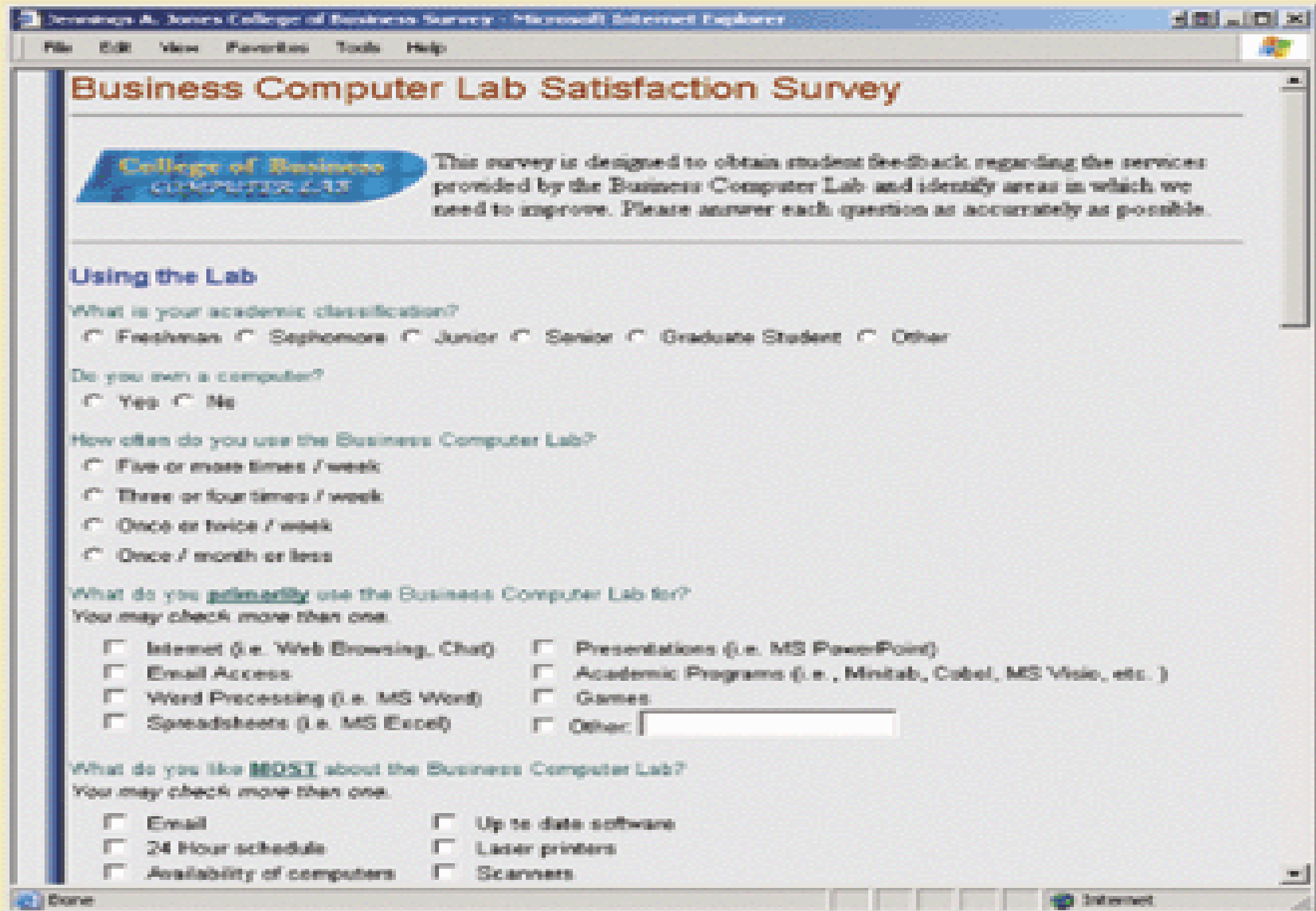
- Purpose of Database Systems
- View of Data
- Data Models
- Data Definition Language
- Data Manipulation Language

Data vs. Information

- Data:
 - Raw facts; building blocks of information
 - Unprocessed information
- Information:
 - Data processed to reveal meaning
- Accurate, relevant, and timely information is key for good decision making
- Good decision making is the key for survival in a global environment

Transforming Raw Data into Information

a) Initial Survey Screen



Settings A Jones College of Business Survey - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Business Computer Lab Satisfaction Survey

**College of Business
COMPUTER LAB**

This survey is designed to obtain student feedback regarding the services provided by the Business Computer Lab and identify areas in which we need to improve. Please answer each question as accurately as possible.

Using the Lab

What is your academic classification?

☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior ☐ Graduate Student ☐ Other

Do you own a computer?

☐ Yes ☐ No

How often do you use the Business Computer Lab?

☐ Five or more times / week
☐ Three or four times / week
☐ Once or twice / week
☐ Once / month or less

What do you primarily use the Business Computer Lab for?
You may check more than one.

<input type="checkbox"/> Internet (i.e. Web Browsing, Chat)	<input type="checkbox"/> Presentations (i.e. MS PowerPoint)
<input type="checkbox"/> Email Access	<input type="checkbox"/> Academic Programs (i.e. , Minitab, Cobol, MS Visio, etc.)
<input type="checkbox"/> Word Processing (i.e. MS Word)	<input type="checkbox"/> Games
<input type="checkbox"/> Spreadsheets (i.e. MS Excel)	<input type="checkbox"/> Other: <input type="text"/>

What do you like MOST about the Business Computer Lab?
You may check more than one.

<input type="checkbox"/> Email	<input type="checkbox"/> Up to date software
<input type="checkbox"/> 24 Hour schedule	<input type="checkbox"/> Laser printers
<input type="checkbox"/> Availability of computers	<input type="checkbox"/> Scanners

Done Internet

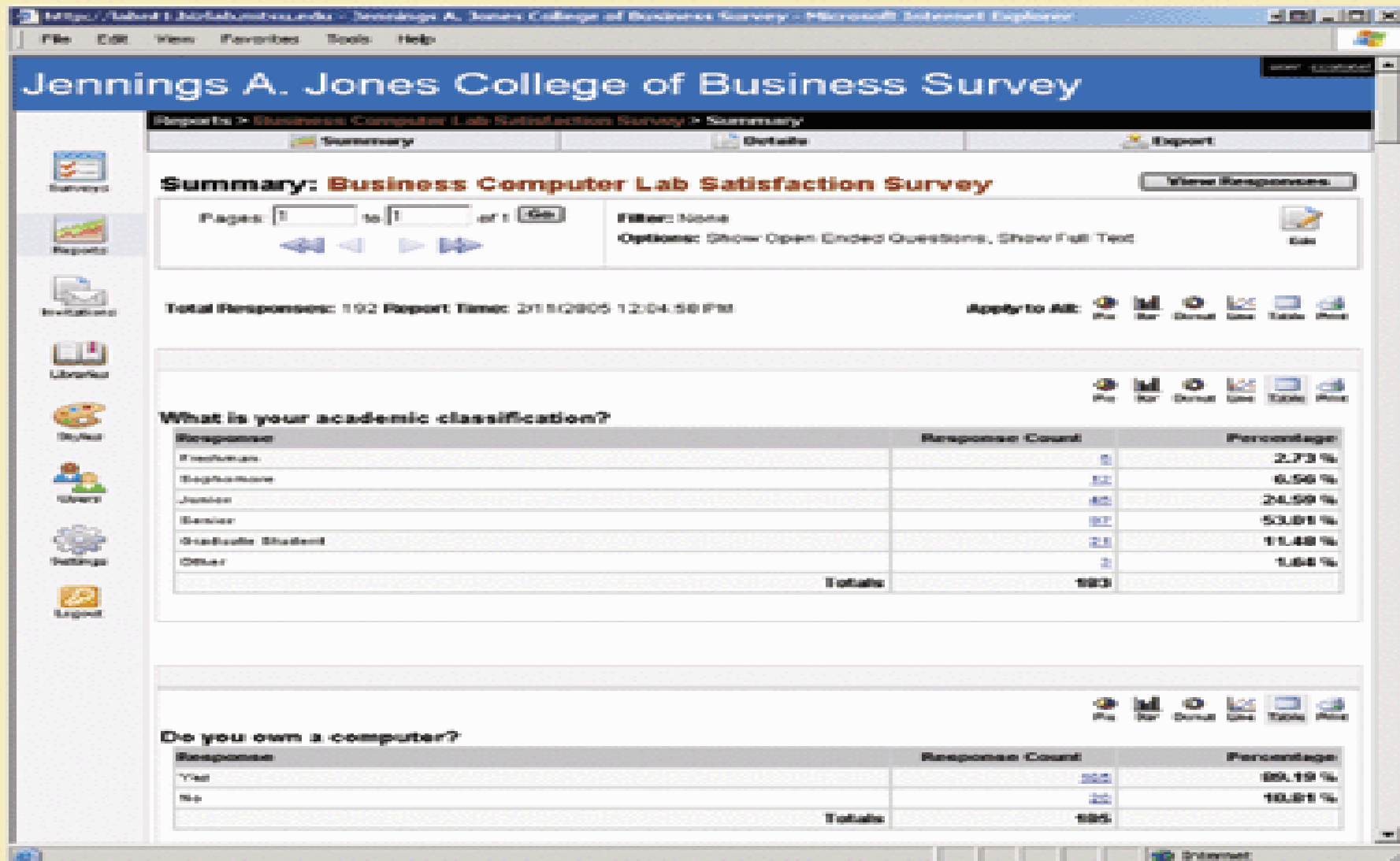
Transforming Raw Data into Information (continued)

b) Raw Data

	A	B	C	D	E	F	G	H	I	J
AcadClass	OwnComputer	HowOftenUsed	ab	Primary	Primary	Primary	Primary	Primary	Primary	Primary
2	Gra	N	5W	0	1	1	1	1	1	1
3	Sen	Y	5W	1	0	0	0	1	1	1
4	Sen	Y	1W	0	0	0	1	0	0	0
5	Sen	Y	1W	1	0	0	0	1	0	0
6	Sen	Y	3W	0	0	0	0	1	0	0
7	Gra	N	5W	0	0	0	0	1	1	1
8	Sen	Y	1W	1	0	0	0	1	0	0
9	Sen	Y	3W	1	0	1	0	1	1	0
10	Sen	Y	1W	0	0	0	1	0	1	0
11	Sen	Y	5W	0	1	0	0	0	0	0
12	Jun	Y	1W	1	0	0	0	1	0	1
13	Sen	N	5W	1	0	0	1	1	1	1
14	Jun	Y	1W	0	0	0	1	0	0	0
15	Sen	Y	5W	0	0	0	1	0	0	0
16	Jun	Y	1M	0	1	0	0	0	0	1
17	Sen	Y	1W	0	0	1	0	0	0	0
18	Sen	Y	1W	0	0	1	1	0	0	0
19	Gra	N	5W	1	0	0	1	0	1	1
20	Gra	Y	1M	0	1	0	0	0	0	0
21	Gra	Y	5W	0	0	1	1	1	1	1
22	Sen	N	3W	0	0	1	1	1	1	0
23	Jun	Y	1W	1	0	0	0	0	0	0
24	Sen	Y	3W	1	1	0	1	1	1	0
25	Jun	Y	1W	1	0	0	0	1	0	0
26	Jun	Y	1W	1	0	0	0	0	1	1
27	Sen	Y	1M	1	0	0	0	0	1	0
28	Sen	Y	5W	0	0	0	0	1	0	1
29	Gra	Y	1M	0	0	0	1	0	0	1
30	Gra	Y	5W	1	1	0	0	1	1	1
31	Jun	N	5W	1	0	0	1	1	1	1
32	Jun	Y	3W	1	0	0	1	0	0	0
33	Gra	Y	5W	0	1	0	1	0	1	1

Transforming Raw Data into Information (continued)

c) Information in Summary Format



Transforming Raw Data into Information (continued)

d) Information in Graphic Format



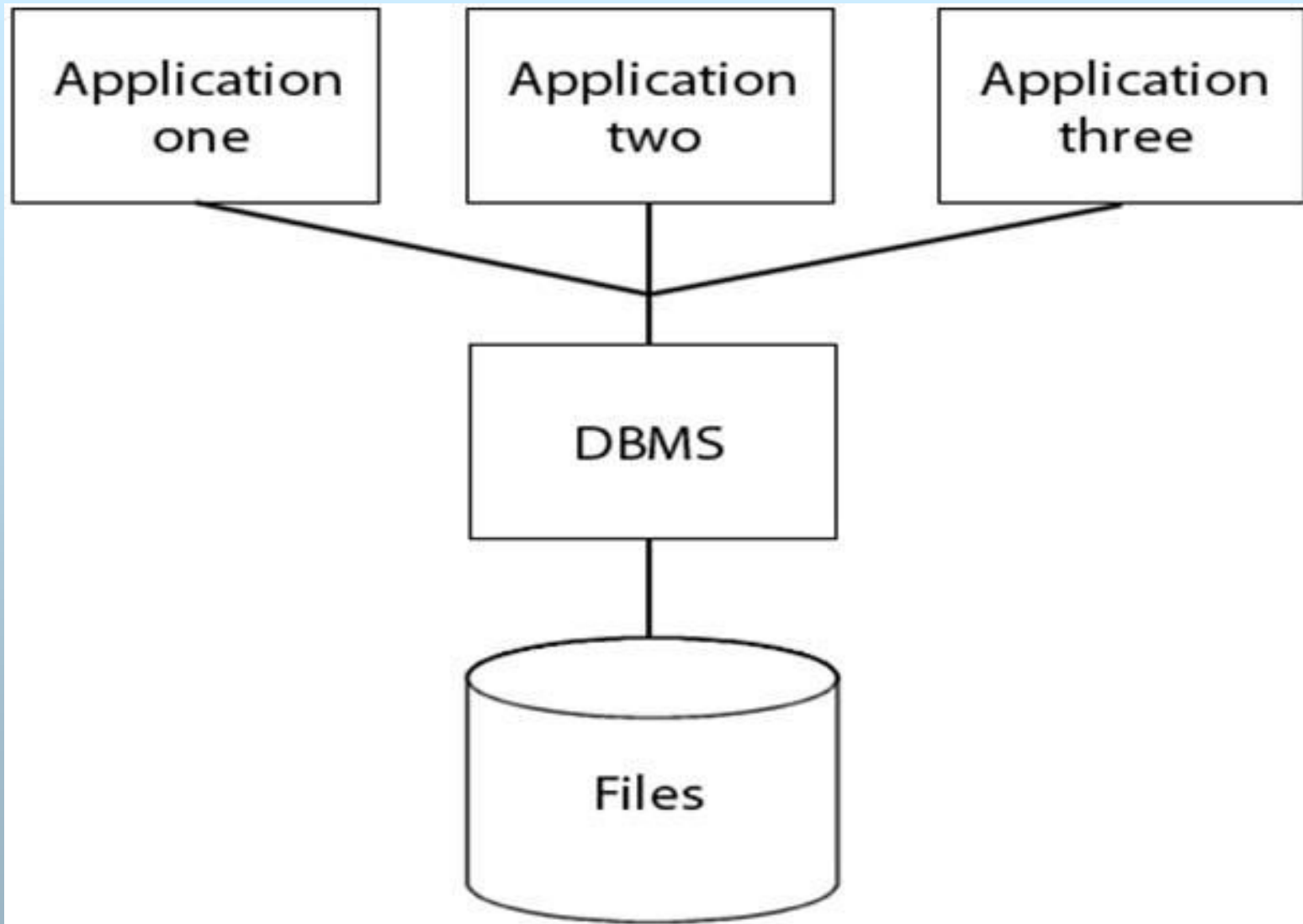
Introducing the Database and the DBMS

- Database—shared, integrated computer structure that stores:
 - End user data (raw facts)
 - Metadata (data about data)

Introducing the Database and the DBMS (continued)

- DBMS (database management system):
 - Collection of programs that manages database structure and controls access to data
 - Possible to share data among multiple applications or users
 - Makes data management more efficient and effective

Role and Advantages of the DBMS (continued)



Database Management System (DBMS)

- Database Applications:
 - Banking: all transactions
 - Airlines: reservations, schedules
 - Universities: registration, grades
 - Sales: customers, products, purchases
 - Manufacturing: production, inventory, orders, supply chain
 - Human resources: employee records, salaries, tax deductions
- Databases touch all aspects of our lives

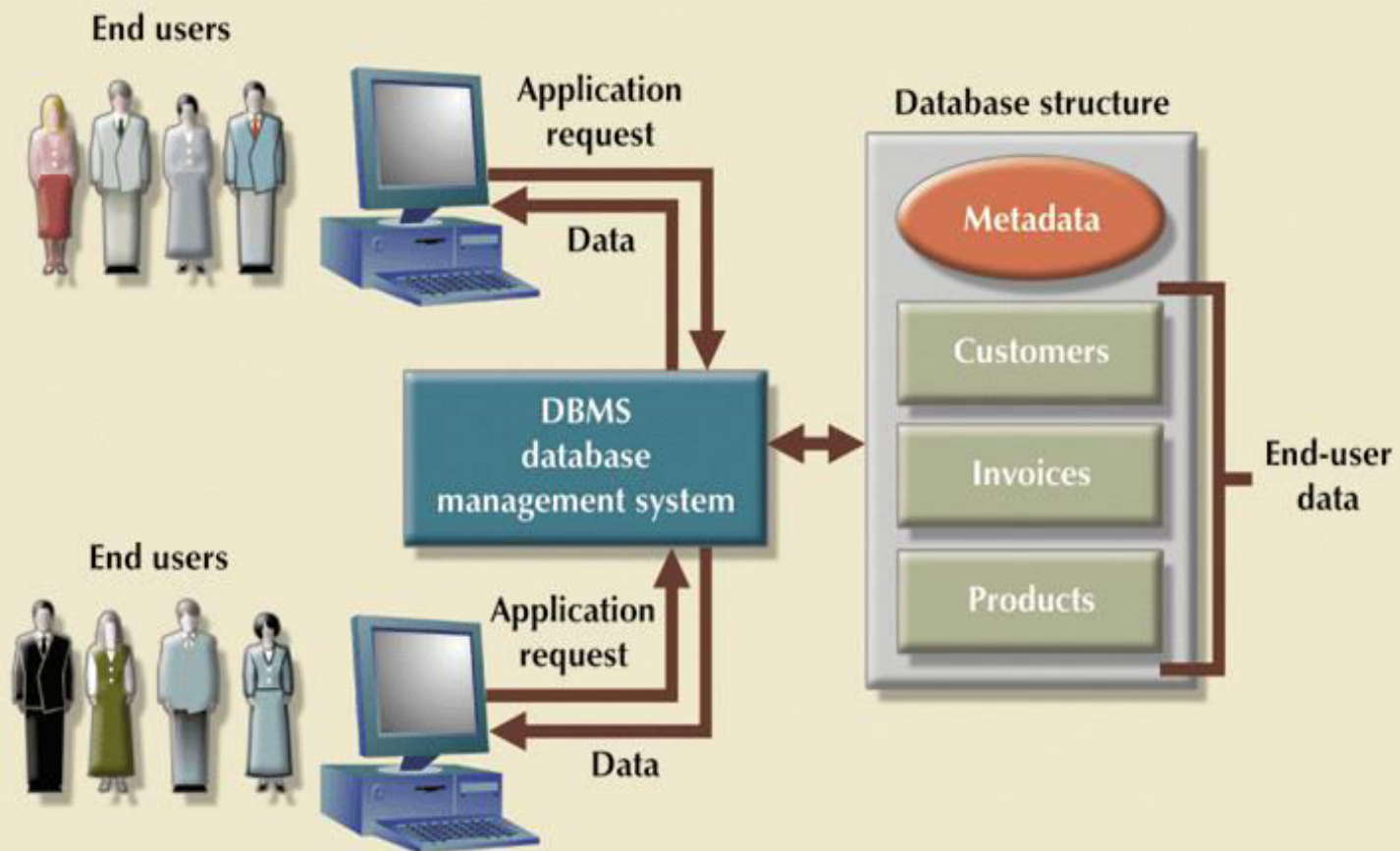
Role and Advantages of the DBMS (continued)

- End users have better access to more and better-managed data
 - Promotes integrated view of organization's operations
 - Probability of data inconsistency is greatly reduced
 - Possible to produce quick answers to ad hoc queries

Role and Advantages of the DBMS (continued)

FIGURE 1.2

The DBMS manages the interaction between the end user and the database



Types of Databases

- Single-user:
 - Supports only one user at a time
- Desktop:
 - Single-user database running on a personal computer
- Multi-user:
 - Supports multiple users at the same time

Types of Databases (continued)

□ Workgroup:

- Multi-user database that supports a small group of users or a single department

□ Enterprise:

- Multi-user database that supports a large group of users or an entire organization

Types of Databases (continued)

Can be classified by location:

- Centralized:

 - Supports data located at a single site

- Distributed:

 - Supports data distributed across several sites

Types of Databases (continued)

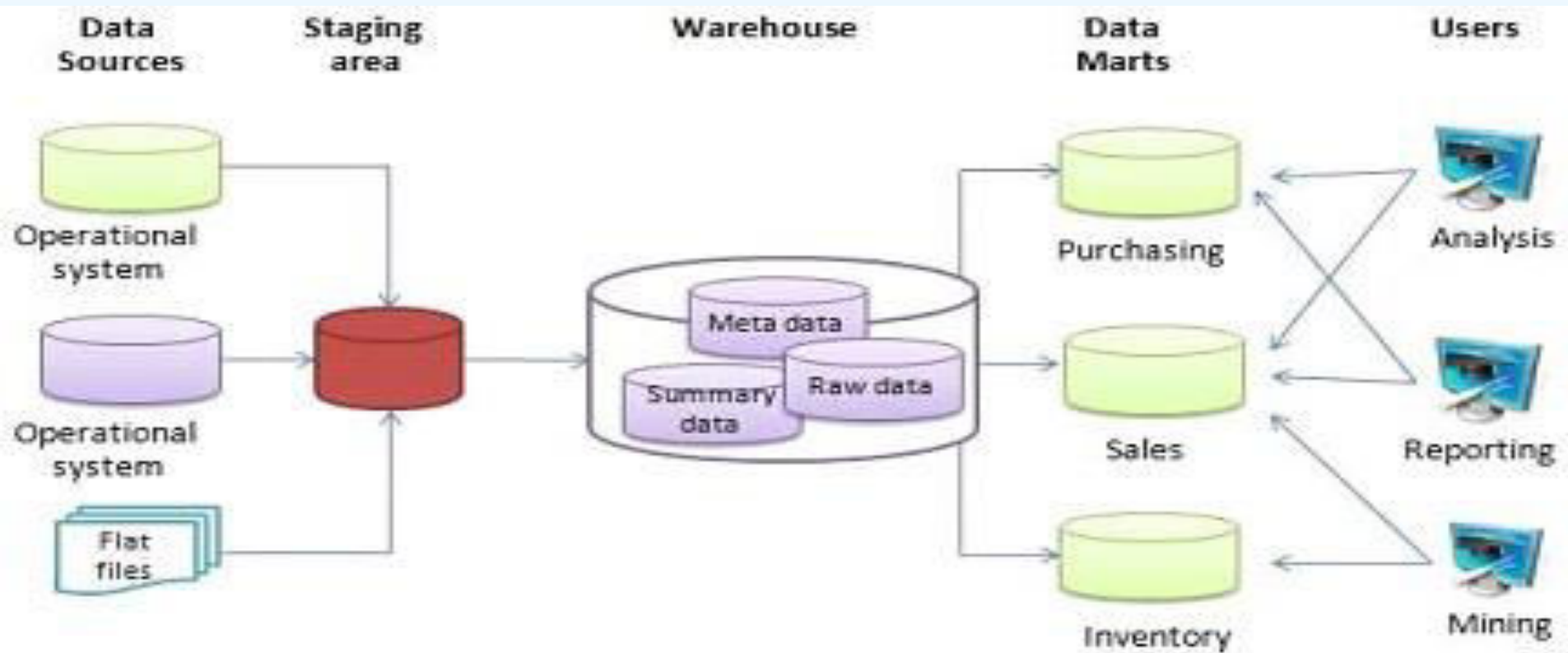
Can be classified by use:

- ❑ Transactional (or production):

- ❑ Supports a company's day-to-day operations

- ❑ Data warehouse:

- ❑ Stores data used to generate information required to make tactical or strategic decisions
 - ❑ Often used to store historical data
 - ❑ Structure is quite different



The basic architecture of a data warehouse

Extract, transform, load (ETL)

Extract, load, transform (E-LT)

Purpose of Database System

- ❑ Office Records or File Systems



Why Database Design is Important

- Defines the database's expected use
- Different approach needed for different types of databases
- Avoid redundant data
- Poorly designed database generates errors → leads to bad decisions → can lead to failure of organization

Purpose of Database System

- In the early days, database applications were built on top of file systems