

# Introduction to Databases

CT042-3-1-IDB

## Lecture 1: Introduction to Database

# Topic & Structure of The Lesson

- Data vs Information
- Database vs DBMS
- Types of database

# Learning Outcomes

- **At the end of this topic, You should be able to**
  - Explain the difference between data and information
  - Describe the difference between database and DBMS
  - State different types of database

# Key Terms You Must Be Able To Use

- If you have mastered this topic, **you should be able to use the following terms correctly in your assignments and exams:**
  - Data
  - Information
  - Database
  - Database Management System

# In this chapter, you will learn:

- The difference between data and information
- What a database is, what the different types of databases are, and why they are valuable assets for decision making
- The importance of database design
- How modern databases evolved from file systems

## In this chapter, you will learn (continued):

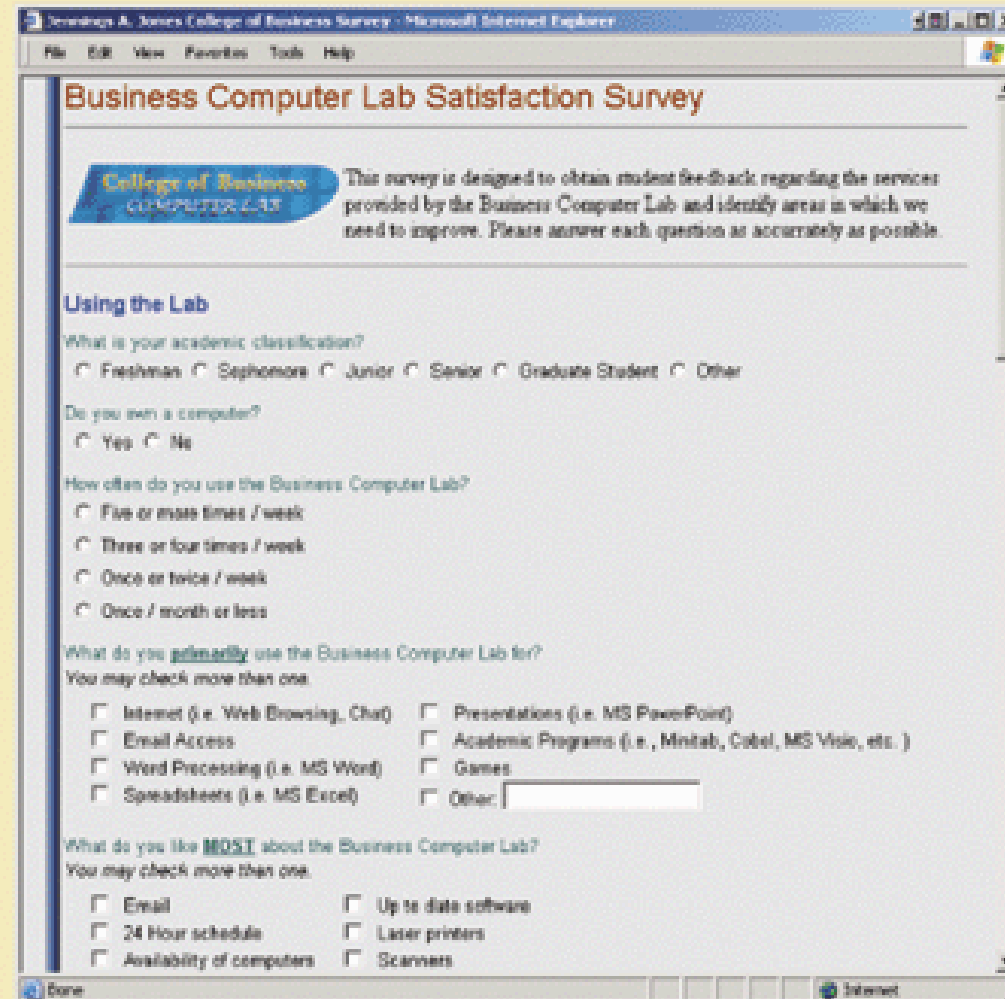
- About flaws in file system data management
- What the database system's main components are and how a database system differs from a file system
- The main functions of a database management system (DBMS)

# 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 to good decision making
- Good decision making is the key to survival in a global environment

# Transforming Raw Data into Information

## a) Initial Survey Screen



Donatella 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, Cobot, 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



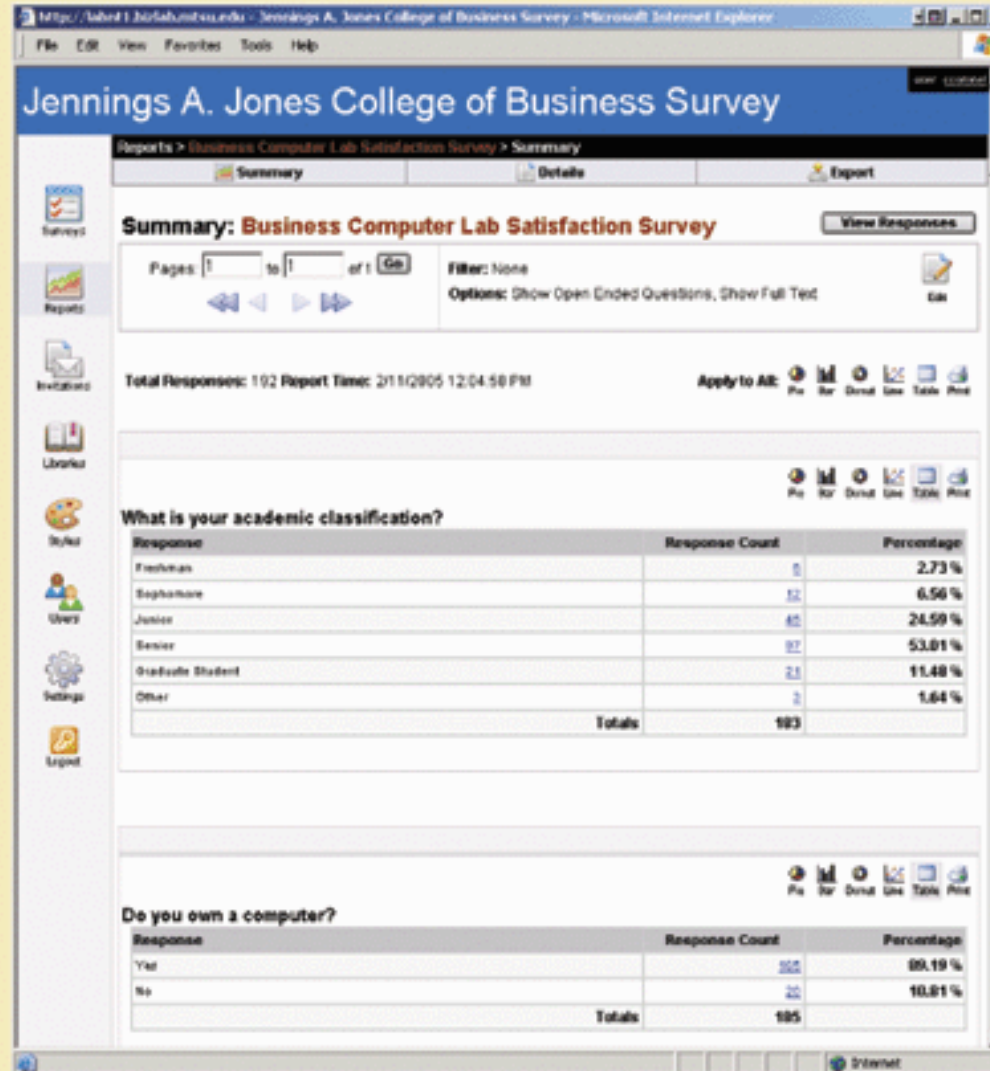
# Transforming Raw Data into Information (continued)

b) Raw Data

	A	B	C	D	E	F	G	H	I	J
1	AcadClass	OwnComputer	HowOftenUseLab	PrimarilyI	PrimarilyI	PrimarilyI	PrimarilyI	PrimarilyI	PrimarilyI	PrimarilyI
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

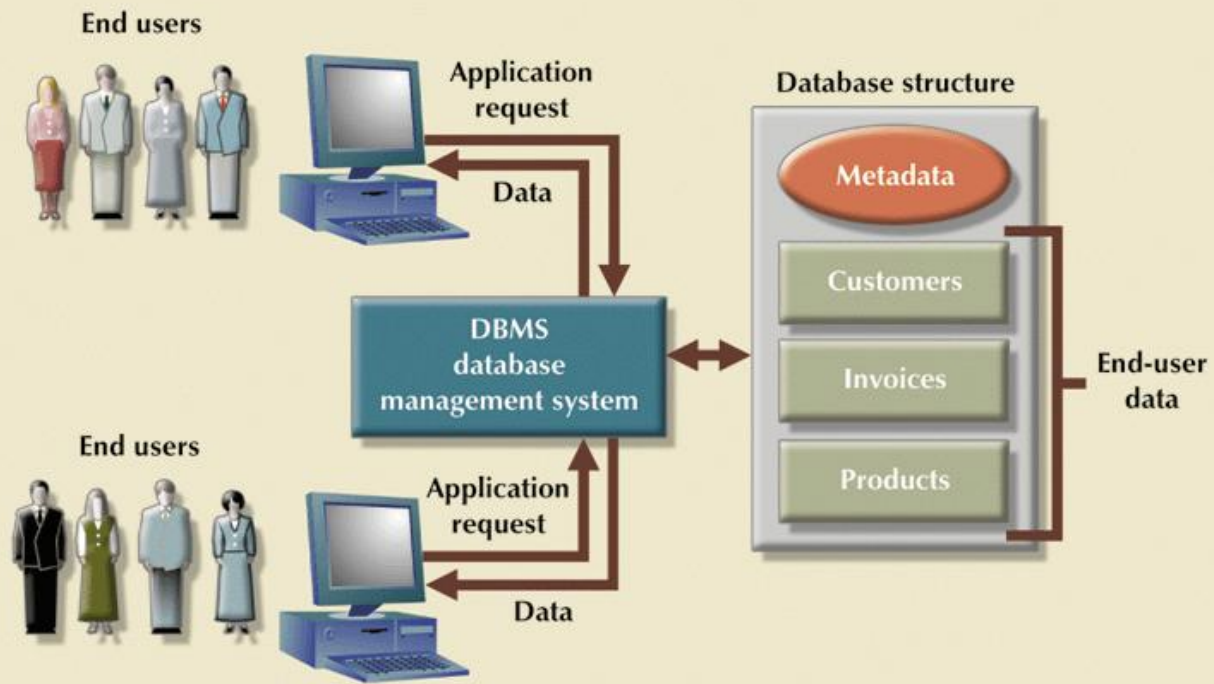
# Role and Advantages of the DBMS (continued)

- 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

# Quick Review Question

- What is the difference between data and information
- Describe the difference between database and DBMS
- Briefly explain 3 types of database

# Summary of Main Teaching Points

- Data are raw facts, information is processed data to reveal meaning
- Database store shared, integrated data.
- DBMS is a collection of programs that manages database structure and controls access to data.
- Database can be classified by usage or location

# Question and Answer Session

Q & A

# What we will cover next

- File System and its problems
- DBMS functions