Introduction to Databases

CT042-3-1-IDB

Lecture 1: Introduction to Database

A·P·U
ASIA PACIFIC UNIVERSITY
OF TECHNOLOGY & INNOVATION

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):

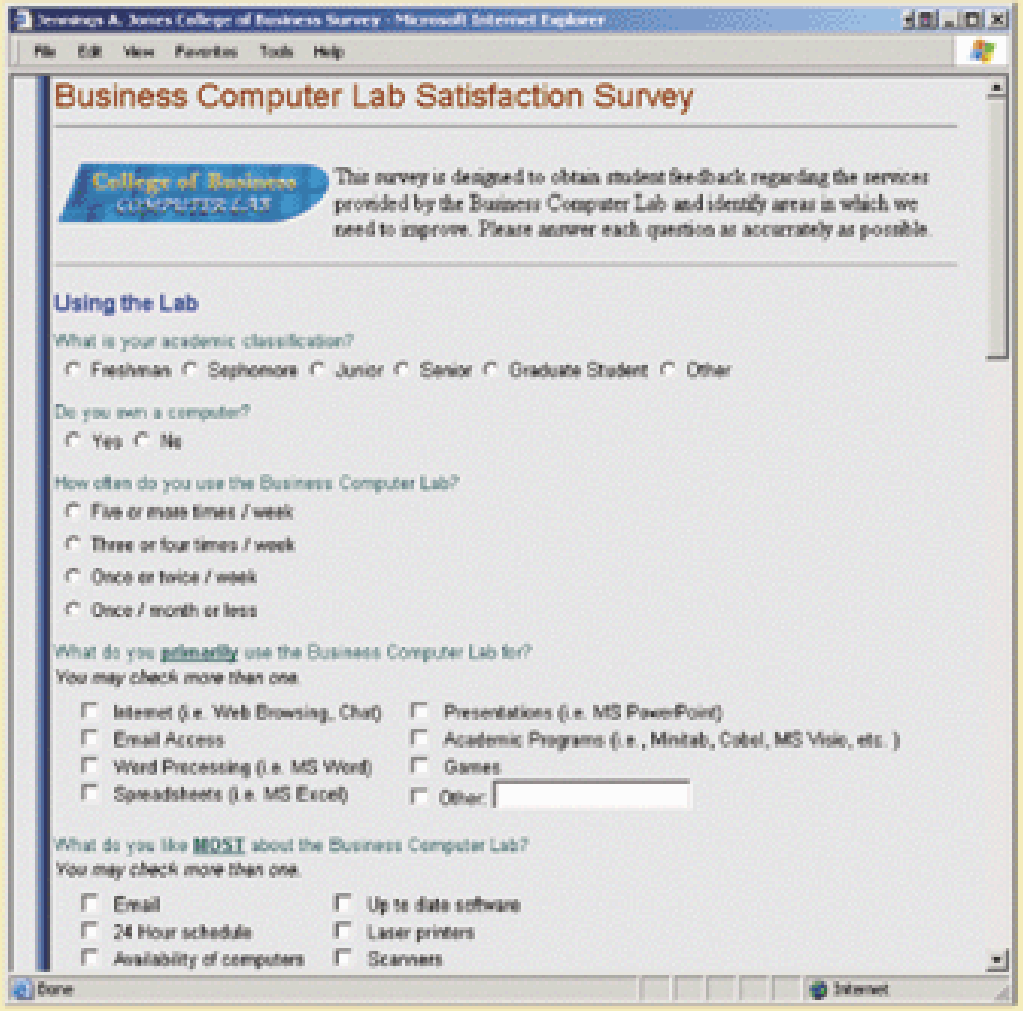
- About flaws in file system data management
- What the database system's main components are and how a database system differs from a file system
- The main functions of a database management system (DBMS)

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



Transforming Raw Data into Information (continued)

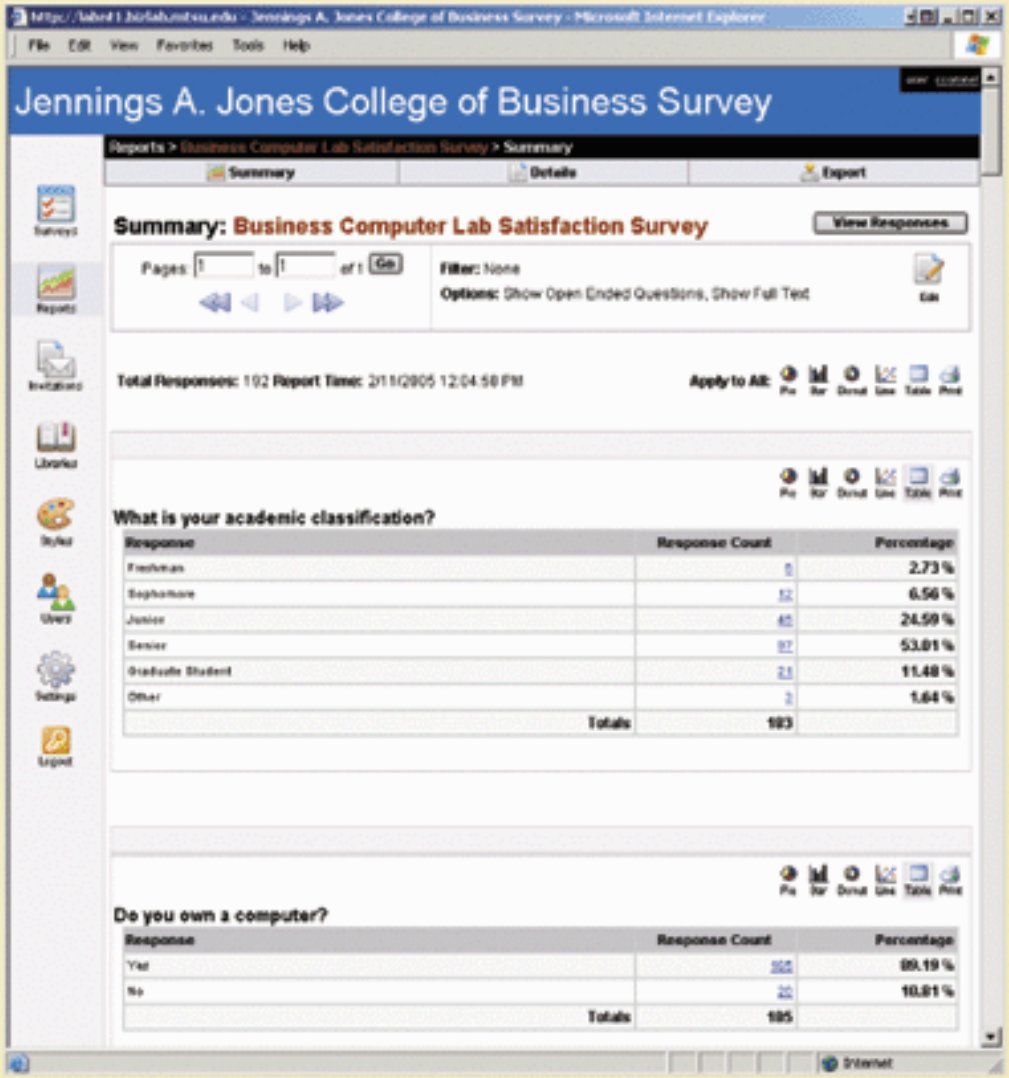
b) Raw Data

	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

SurveyRawData

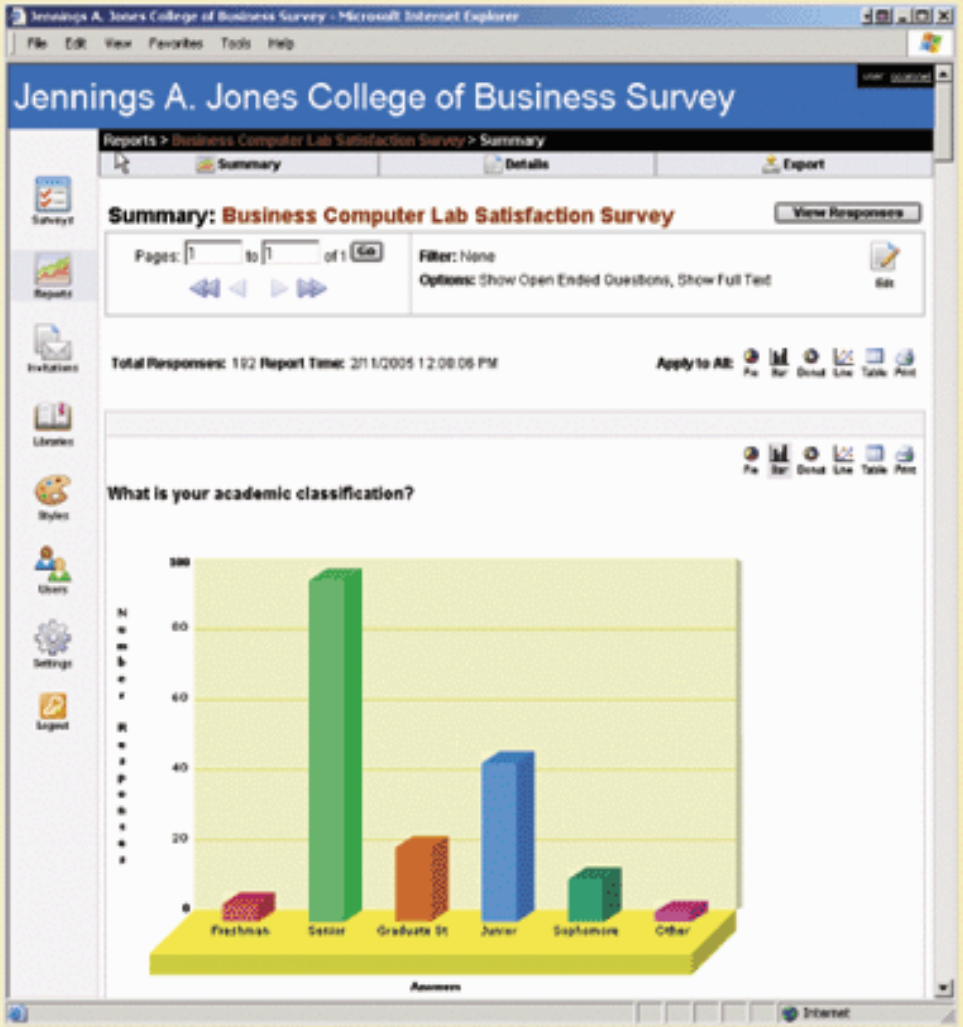
Transforming Raw Data into Information (continued)

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)

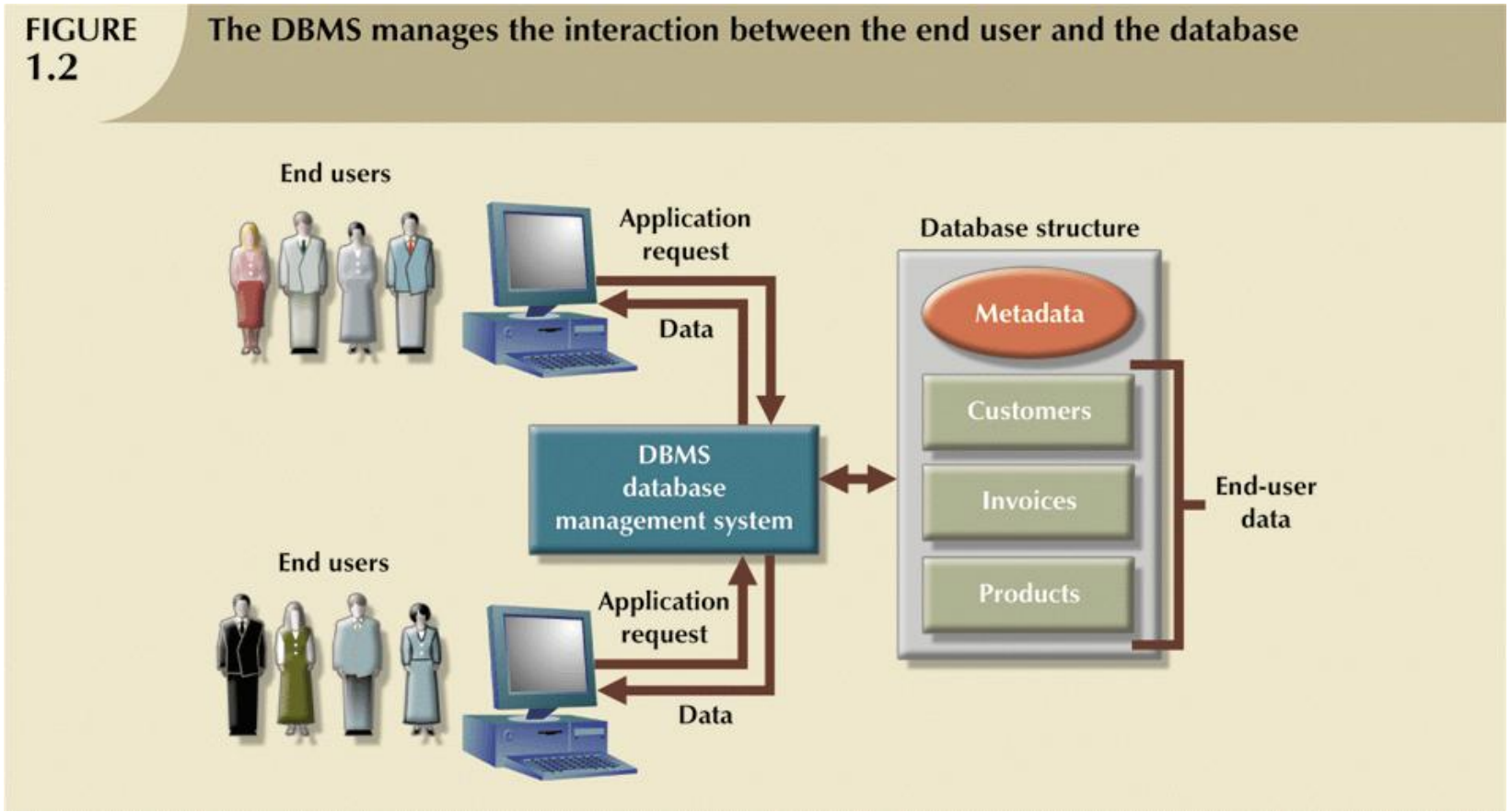
Introducing the Database and the DBMS (continued)

- 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)



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