Database Design

Major Transformations in Computing

Objectives

This lesson covers the following objectives:

- List the major transformations in computing that have occurred since the 1970's.

- Define and give an example of these terms: hardware, operating system, software

- Identify examples of e-businesses that use database software and explain how it is essential to their success

- Explain the overall mission of the Oracle Corporation

Purpose

History provides perspective for where we are today in information technology.

If we know where we have come from, it is easier to understand where we are today, and where we are likely to go in the future.

Your first job upon graduation may not exist 20 years later!

Key Terms

- Hardware: the physical "bits and pieces" of a computer: keyboard, screen, mouse, disk drive, memory, etc.

- Software: programs (sets of instructions) which tell the hardware what to do

- Operating system: a software program which directly controls and manages the hardware: Microsoft Windows, Linux, etc.

- Application: a software program which carries out specific tasks on behalf of computer users

Key Terms (cont.)

- Client: a workstation or desktop computer including a screen, keyboard, and mouse. Clients interact directly with human computer users.

- Server: a more powerful computer that accepts work requests from clients, executes each request, and sends the results back to the client.

Key Terms (cont.)

Every time you request information from a Web page, your client computer sends the request to a database on the server. The server retrieves the data from the database, converts it into useful information, and sends the information back to the client.
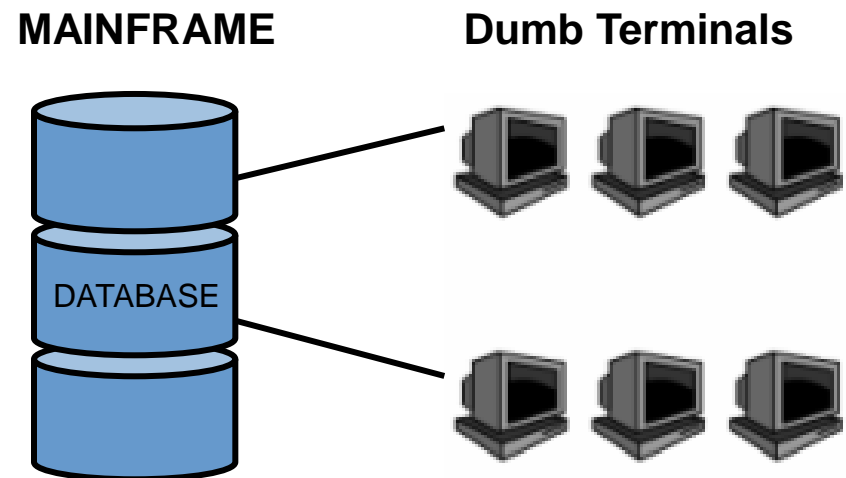
If you pursue a career in IT, you will hear and use these terms nearly every day!

History of Computer Systems

1970s

The database software resided in the mainframe computer. Almost all of the computer processing was done on these large mainframe computers. Some of these computers were larger than your classroom!

1970s Mainframe

MAINFRAME   **Dumb Terminals**

DATABASE

History of Computer Systems (cont.)

Smaller computers, or "dumb terminals," were used to access the large mainframe and execute commands. The terminals depended on the mainframe and displayed the results only after the processing was completed in the mainframe. They were not capable of much processing on their own.
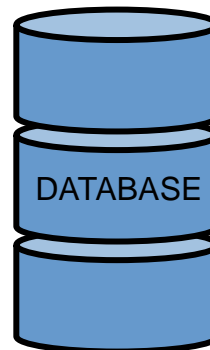
1970s Mainframe

MAINFRAME   **Dumb Terminals**
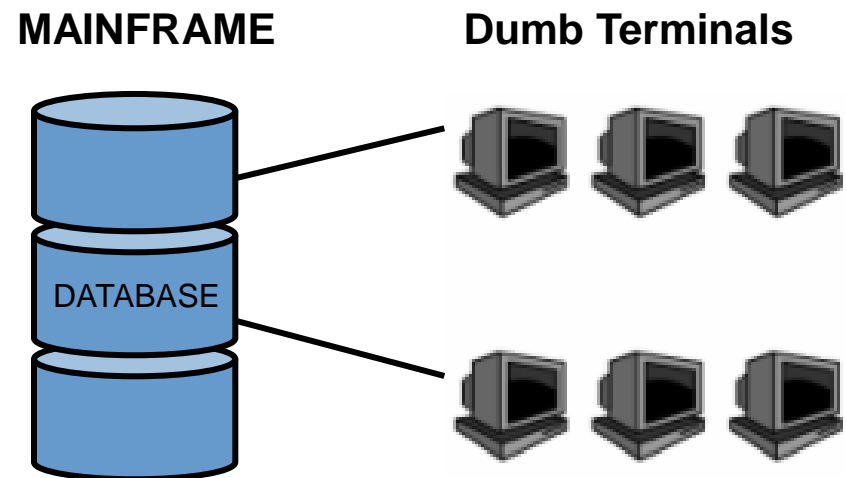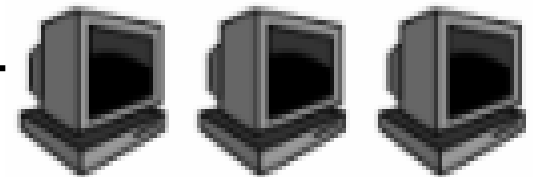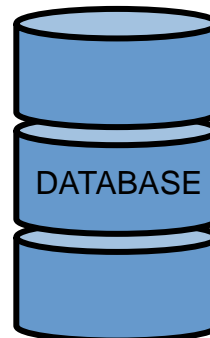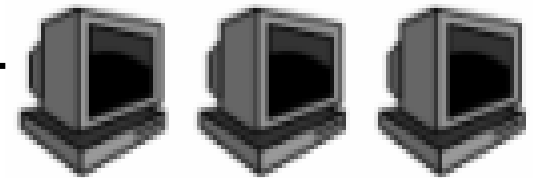
History of Computer Systems (cont.)

1980s

As personal computers (PCs) became faster and widely available, processing moved from the mainframes to the desktop.

1980s Personal Computer

Server Computer: Software

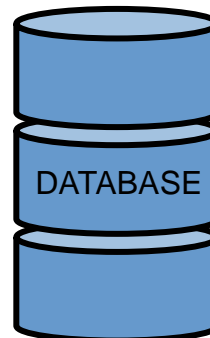**Smart Clients: GUI Interface and Software**
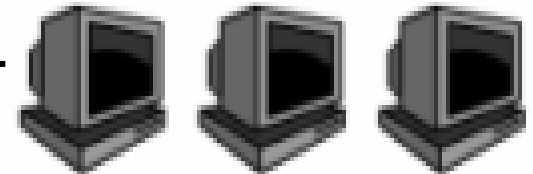
History of Computer Systems (cont.)

Because the PCs had their own software and were capable of doing some processing on their own, they came to be known as "smart clients" or "workstations."

1980s Personal Computer

**Server Computer:
Software**

**Smart Clients:
GUI Interface and Software**
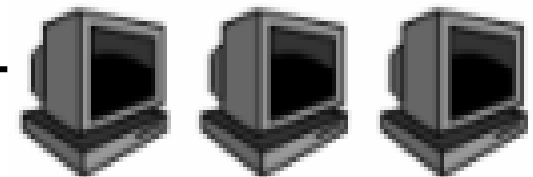
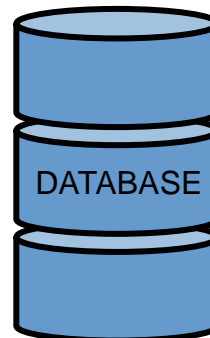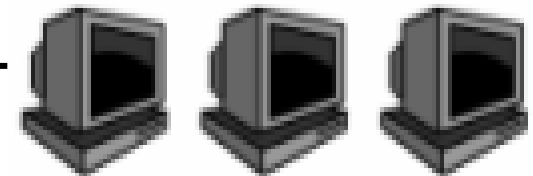# History of Computer Systems (cont.)

Having the processing power within the client machine ushered in a wave of graphical user interface (GUI) applications. Many of the common applications today (Word, Excel, PowerPoint) were born during this era.

1980s Personal Computer

Server Computer: Software

Smart Clients: GUI Interface and Software

DATABASE

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The Problem of Isolated, Nonintegrated Systems

Having multiple applications on multiple client workstations created new problems. In this example, different software on different systems requires integration. This is usually troublesome and expensive.

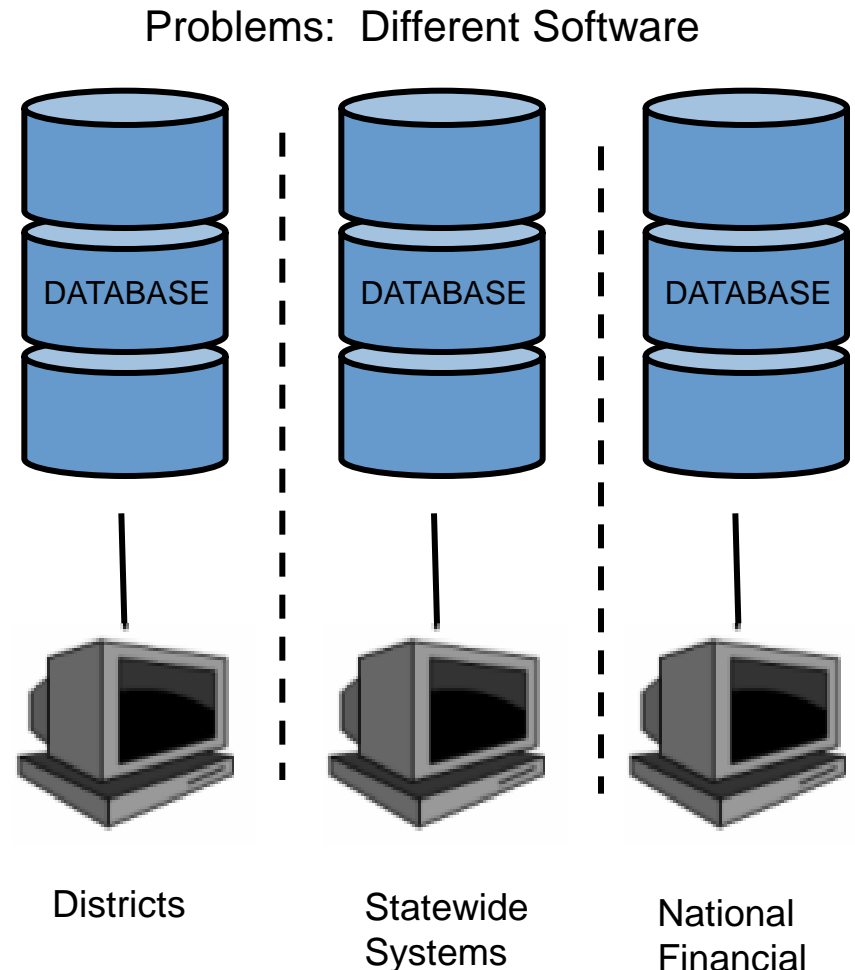Problems: Different Software
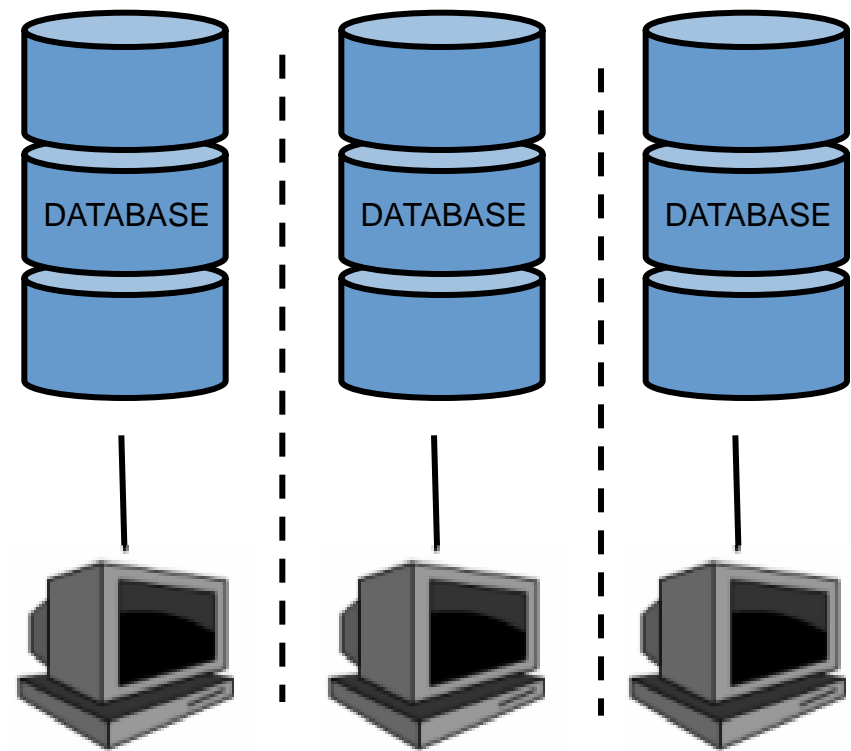
DATABASE DATABASE DATABASE

Districts

Statewide Systems

National Financial

ORACLE ACADEMY

The Problem of Isolated, Nonintegrated Systems (cont.)

If an upgrade is made to a software application, each and every server plus each and every client must be upgraded.

Problems: Different Software

Districts

Statewide Systems

National Financial

The Problem of Isolated, Nonintegrated Systems (cont.)

Think of a school district updating school grades on one system and attendance on another. When a student graduates, all this information needs to be brought together.

Problems: Different Software

Districts

Statewide Systems

National Financial
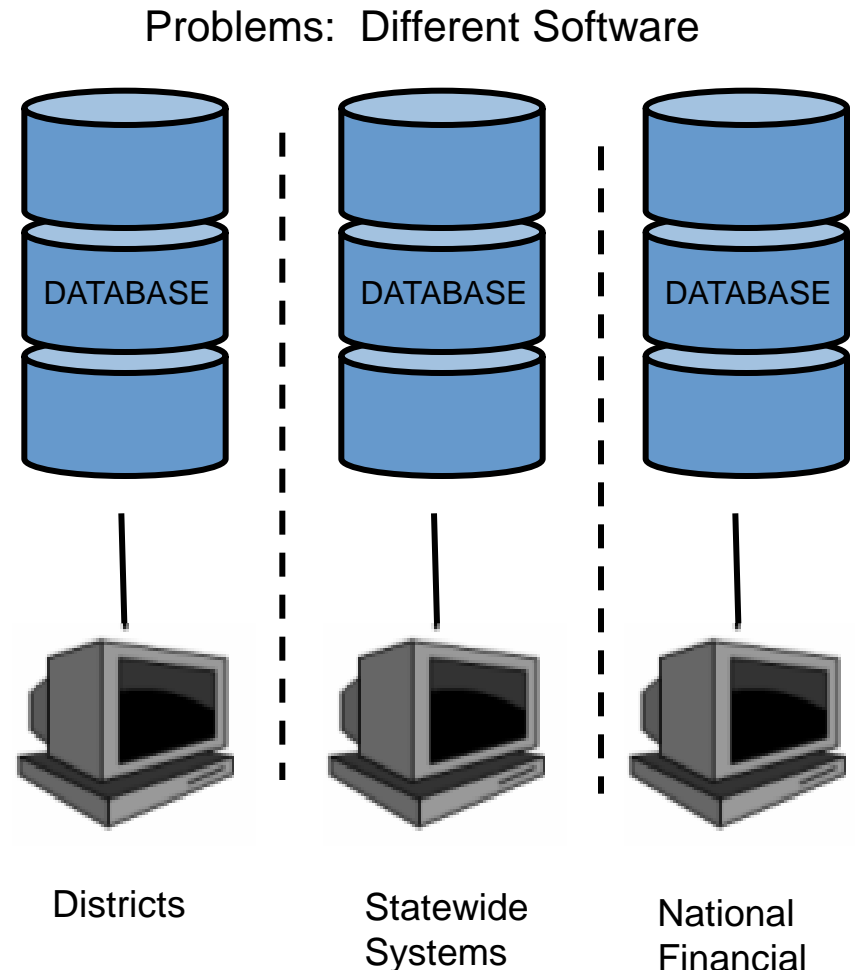
The Problem of Isolated, Nonintegrated Systems (cont.)

Without an integrated system, this can be a painful process, especially if there are thousands of students who attend thousands of days of school! Who will pull all that data together? How?

Problems: Different Software
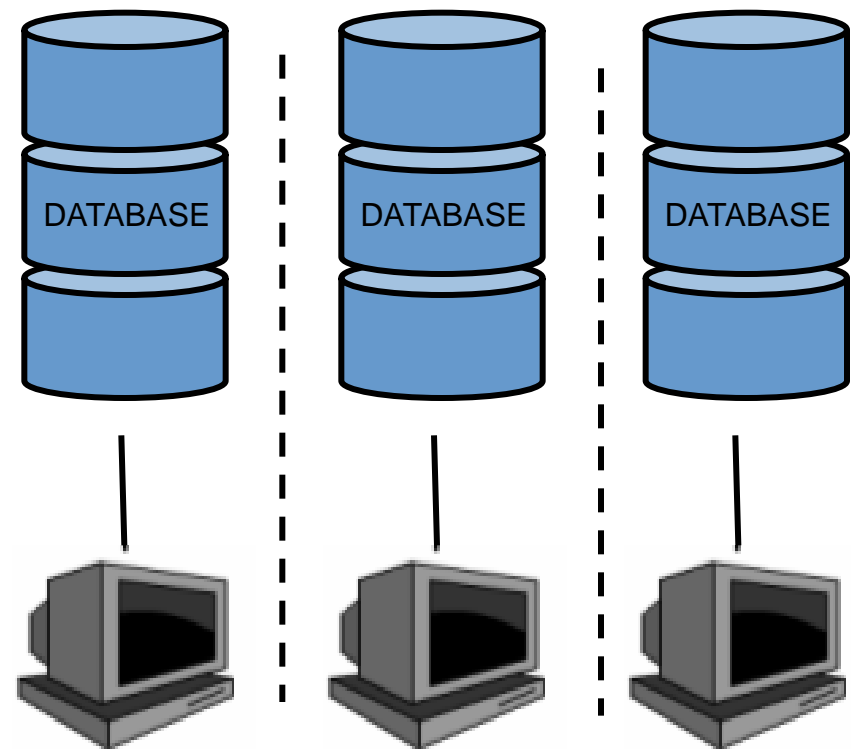
Districts

Statewide Systems

National Financial

1990s and Beyond

Oracle's strategy is to use the Internet and fast processing servers to meet the needs of organizations in storing data and producing information.

1990s and Beyond

Database Server Software

Application Server Software

Thin Clients- GUI Interface, Browser
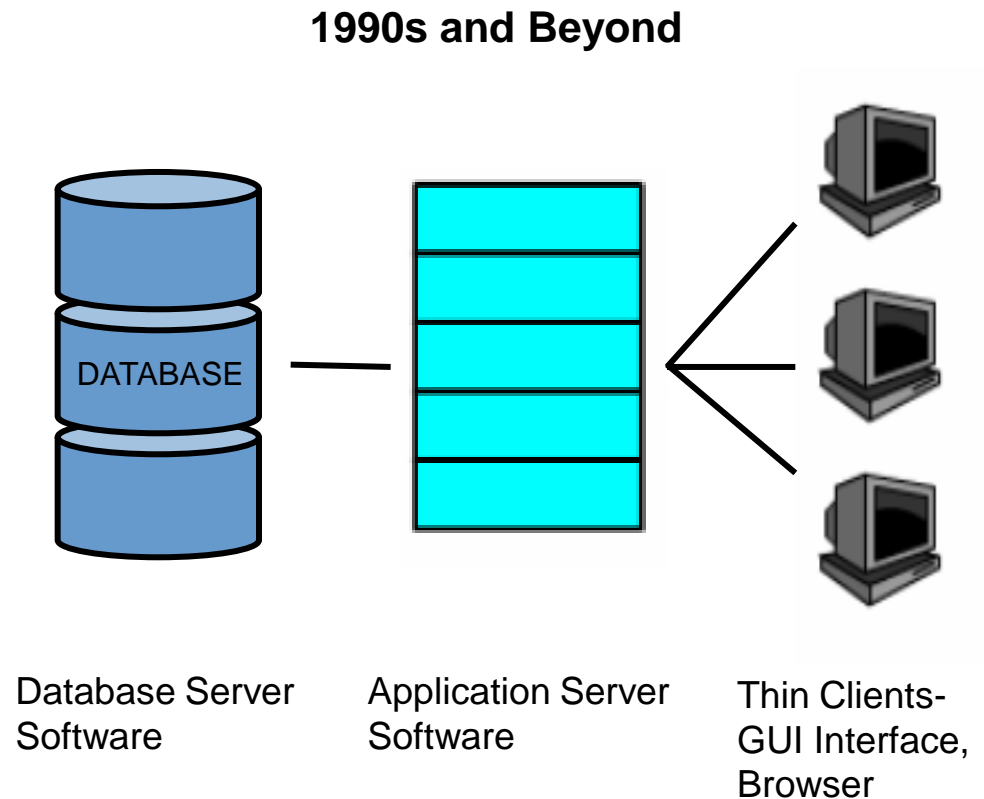
1990s and Beyond (cont.)

The software that manages the data is on the database server. It performs processing for storage and retrieval.

1990s and Beyond

DATABASE

Database Server Software

Application Server Software

Thin Clients- GUI Interface, Browser
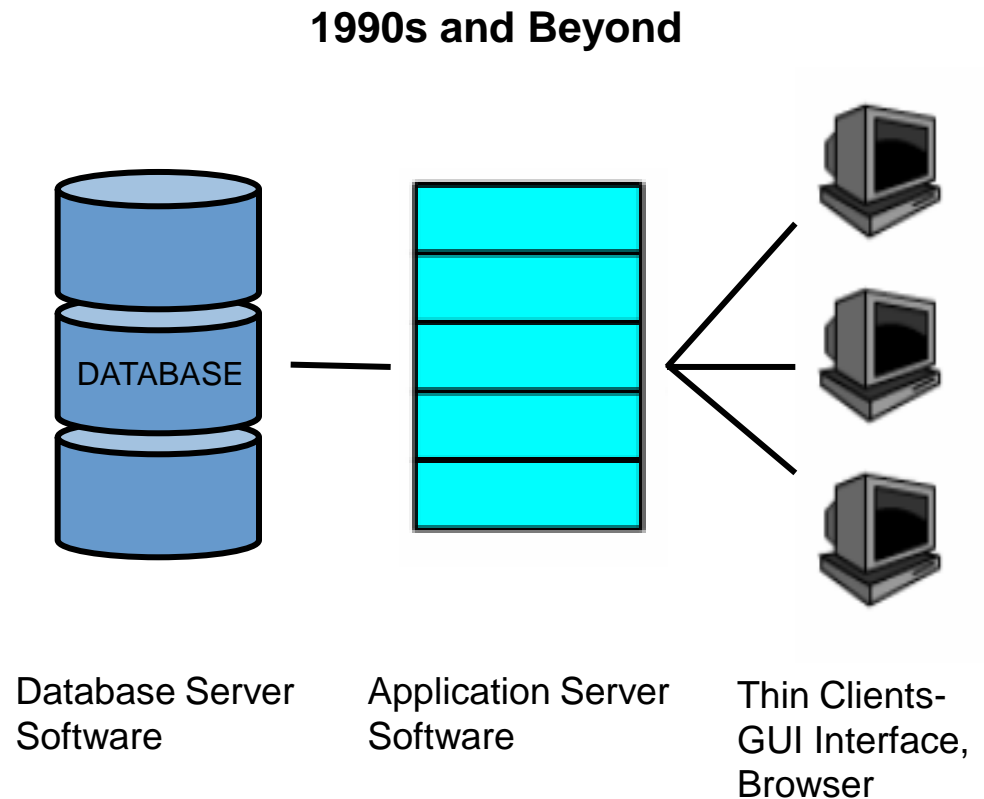
1990s and Beyond (cont.)

Applications for business operations sit on the application server. It interacts with, processes, develops, or manipulates the data for document creation.

1990s and Beyond

DATABASE

Database Server Software

Application Server Software

Thin Clients-GUI Interface, Browser
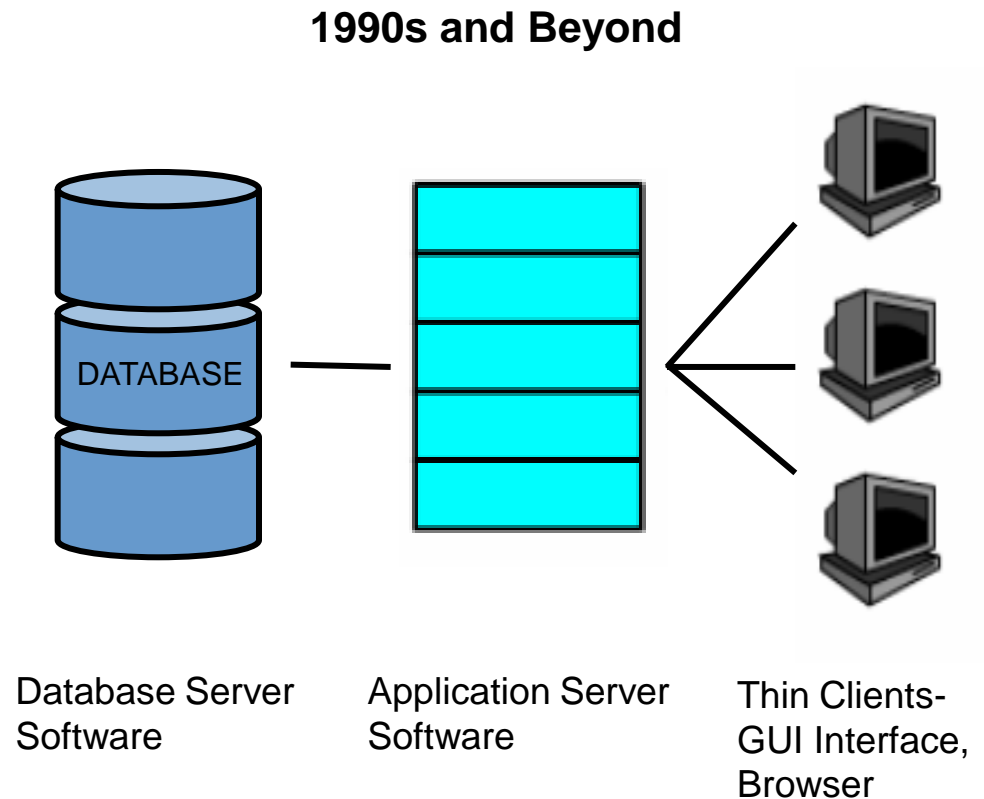
1990s and Beyond (cont.)

Clients provide access to and visual display of the information on the servers. Clients can have applications of their own, but the essential business applications are accessed from the clients using an Internet browser.

1990s and Beyond

DATABASE

Database Server Software

Application Server Software

Thin Clients- GUI Interface, Browser
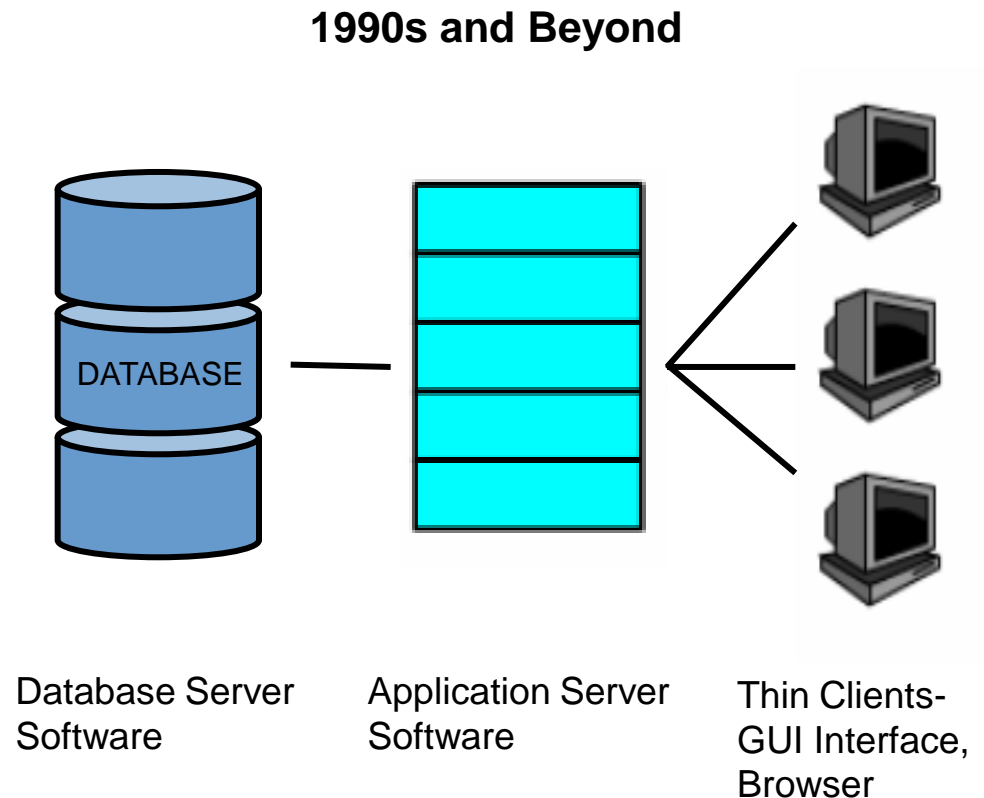
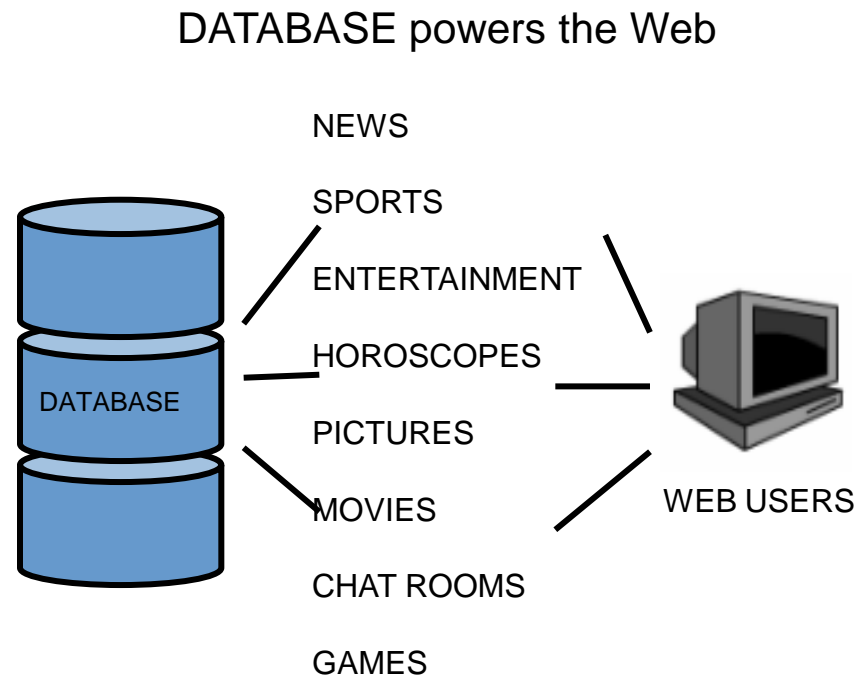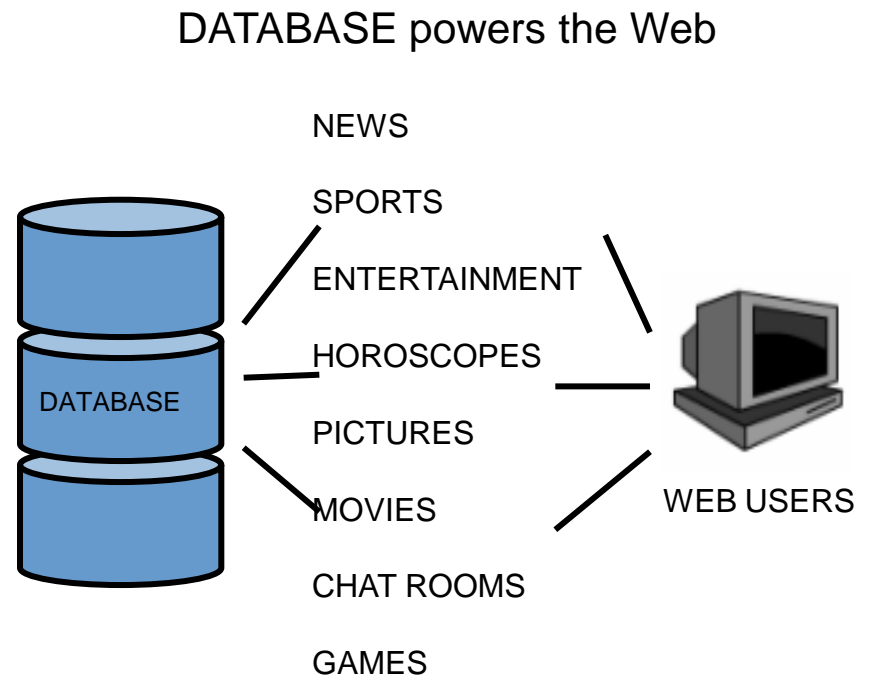# Grid Computing: A New Model

In the grid-computing model, all of an organization's computers in different locations can be utilized just like a pool of computing resources. Grid computing builds a software infrastructure that can run on a large number of networked servers.

DATABASE powers the Web

NEWS

SPORTS

ENTERTAINMENT

HOROSCOPES

DATABASE

PICTURES
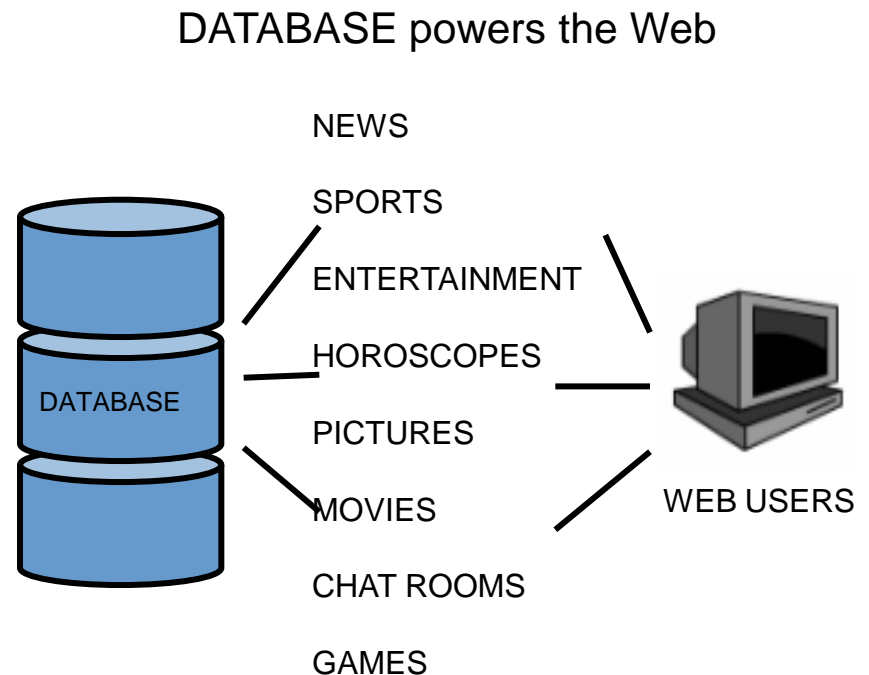
MOVIES

WEB USERS

CHAT ROOMS

GAMES

Grid Computing: A New Model (cont.)

A user makes a request for information or computation from his workstation and that request is processed somewhere in the grid, in the most efficient way possible.

DATABASE powers the Web

NEWS

SPORTS

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HOROSCOPES

DATABASE

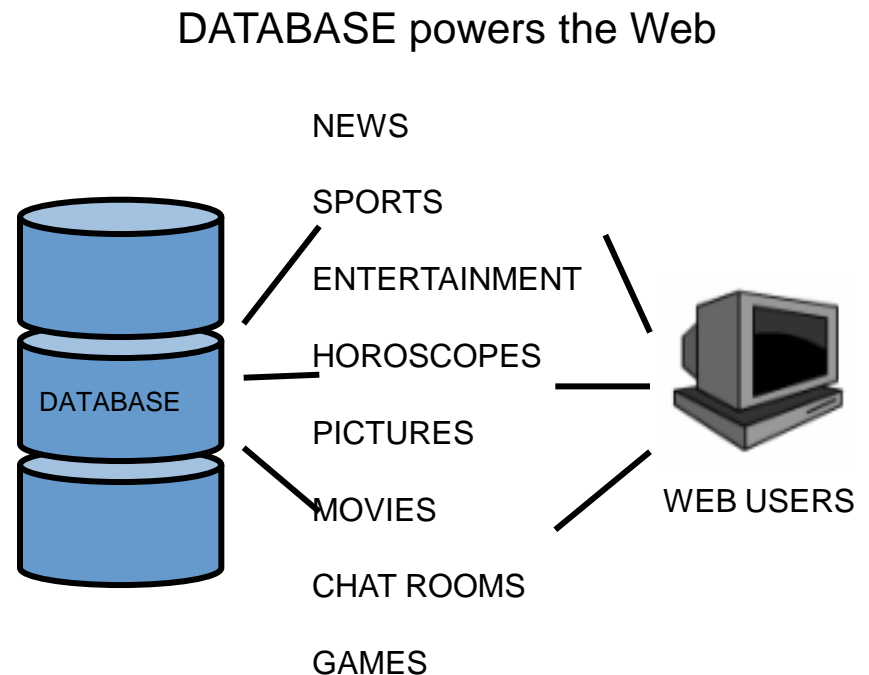PICTURES

MOVIES

WEB USERS

CHAT ROOMS

GAMES

Grid Computing: A New Model (cont.)

Grid computing treats computing as a utility, like the electric company. You don't know where the generator is or how the electric grid is wired. You just ask for electricity and you get it.

DATABASE powers the Web

NEWS

SPORTS

ENTERTAINMENT

HOROSCOPES

DATABASE

PICTURES

MOVIES

WEB USERS

CHAT ROOMS

GAMES

Grid Computing: A New Model (cont.)

Grid Computing improves performance and reliability for Oracle's system structures using database servers, application servers, and client browsers.

DATABASE powers the Web

NEWS

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Business Terminology

- Finance: refers to businesses that deal primarily with money

- Logistics: can be defined as the planning, execution, and control of the movement and placement of people and/or goods

- Commerce: involves transactions (sales and purchases) having the objective of supplying goods and services

- Procurement: refers to all of the processes involved in requesting, ordering, auditing, and paying for goods and services

Business Terminology (cont.)

- Distribution: commercial activity of storing and transporting goods from sellers to buyers

Terminology

Key terms used in this lesson included:

- Application
- Client
- Commerce
- Distribution
- Finance
- Grid computing
- Hardware
- Infrastructure
- Logistics

Terminology (cont.)

Key terms used in this lesson included:

- Operating system
- Procurement
- Server
- Software

Summary

In this lesson, you should have learned how to:

- List the major transformations in computing that have occurred since the 1970's.
- Define and give an example of these terms: hardware, operating system, software
- Identify examples of e-businesses that use database software and explain how it is essential to their success
- Explain the overall mission of the Oracle Corporation