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Database Design

1-4

Major Transformations in Computing

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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 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

- 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

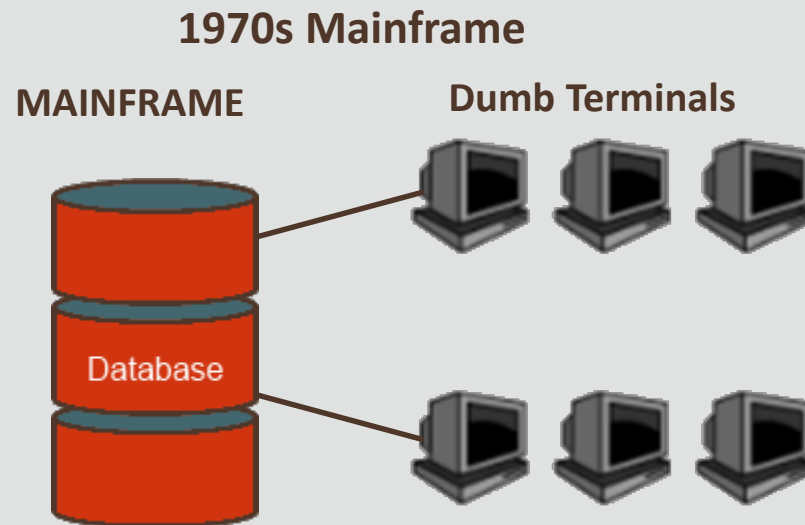
Key Terms

- 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

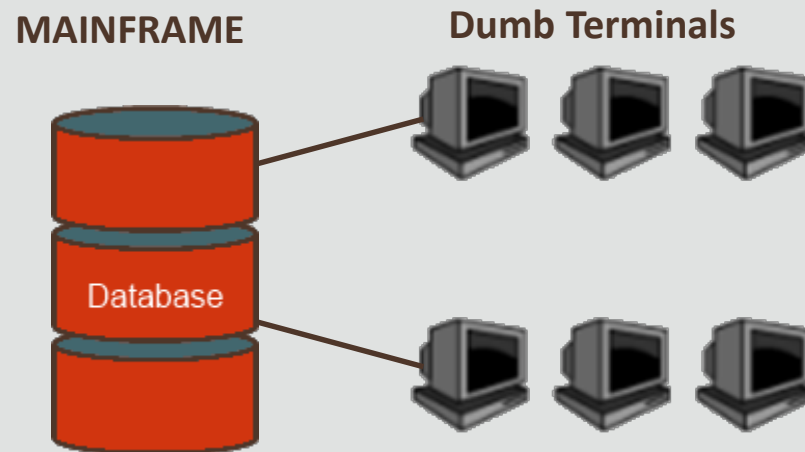
- The database software resided in the mainframe computer
- Almost all of the computer processing was done on these large mainframe computers
- Some of these computers were larger than your classroom!



History of Computer Systems

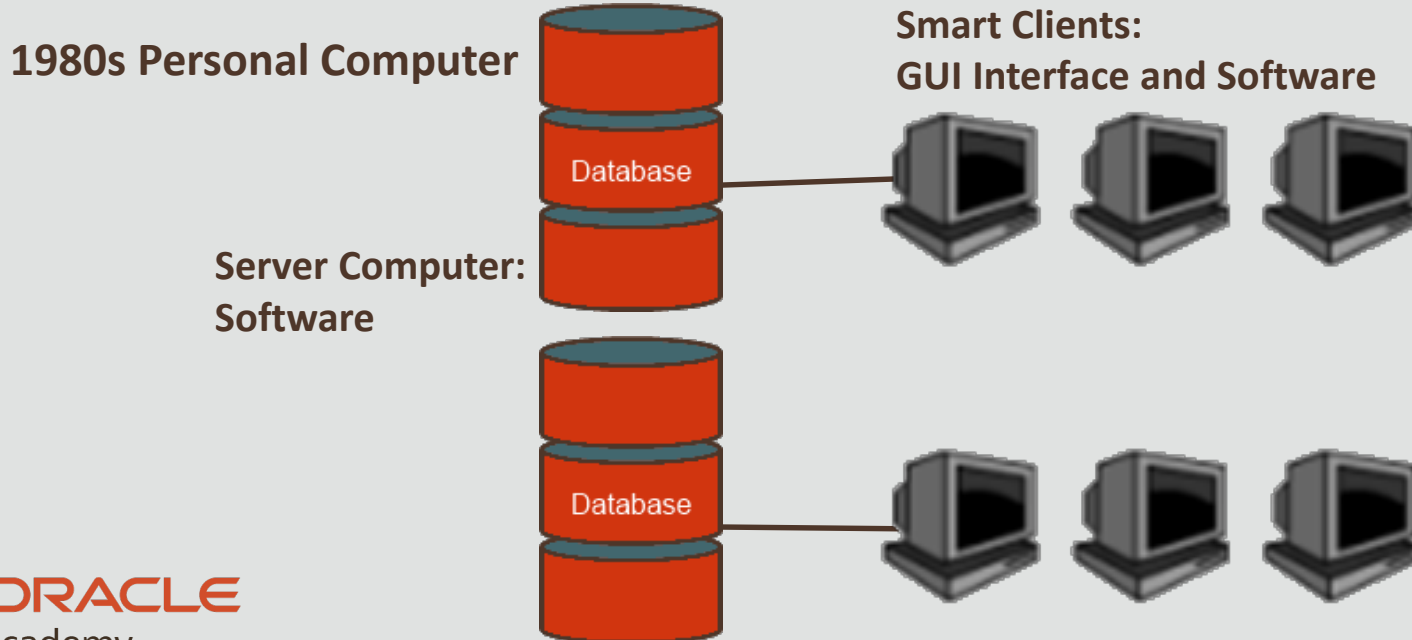
- Smaller computers, or “dumb terminals,” were used to access the large mainframe and execute commands
- The terminals depended on the mainframe and displayed the results only after the processing was completed in the mainframe
- They were not capable of much processing on their own

1970s Mainframe



History of Computer Systems

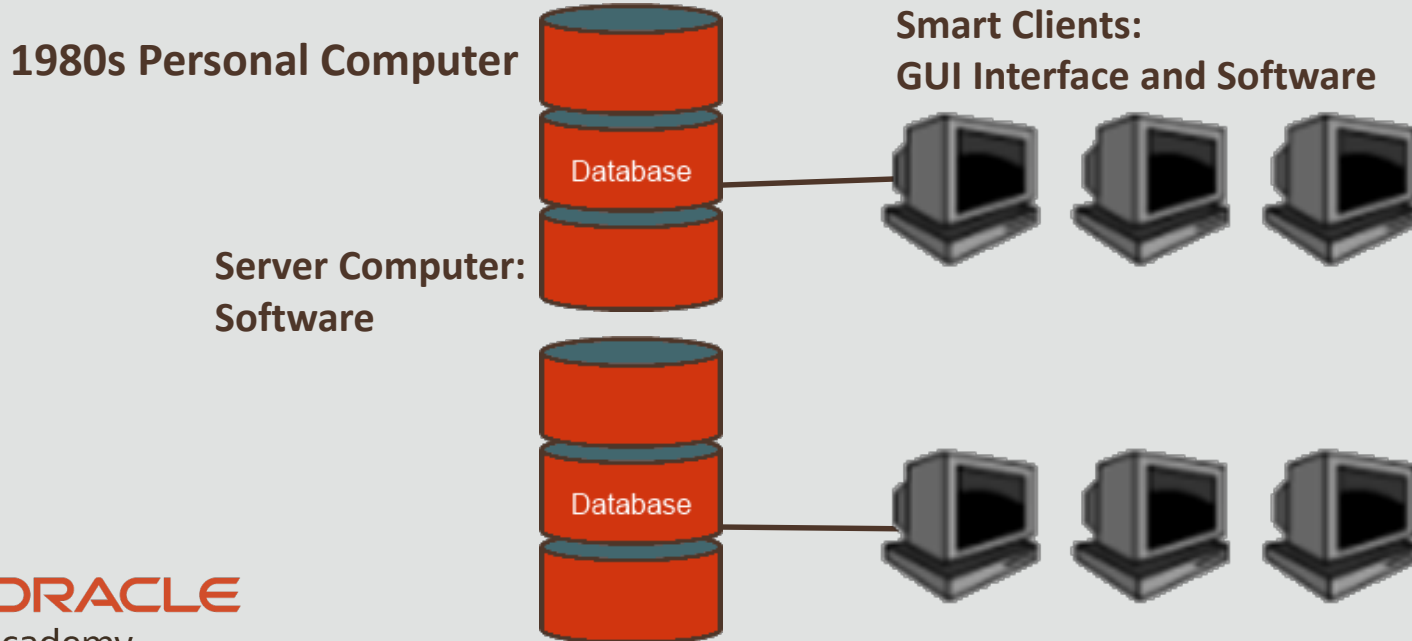
- 1980s
 - As personal computers (PCs) became faster and widely available, processing moved from the mainframes to the desktop



History of Computer Systems

- 1980s

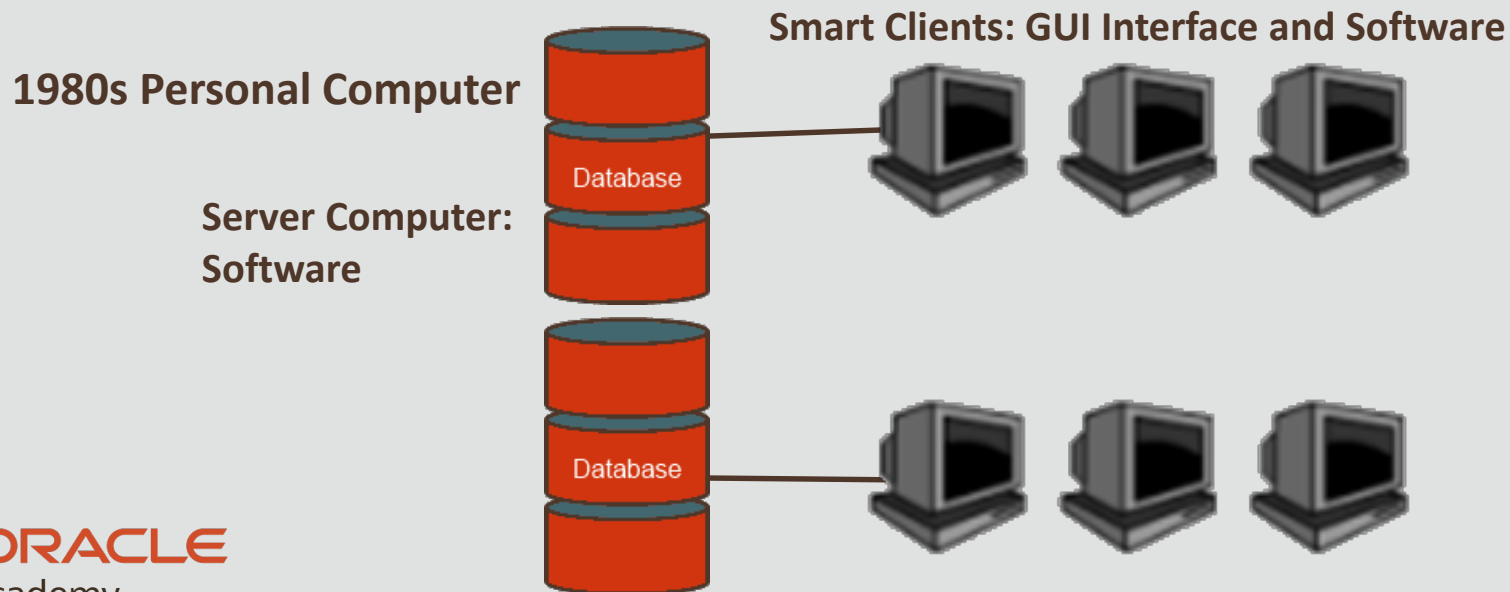
- Because the PCs had their own software and were capable of doing some processing on their own, they came to be known as “smart clients” or “workstations”



History of Computer Systems

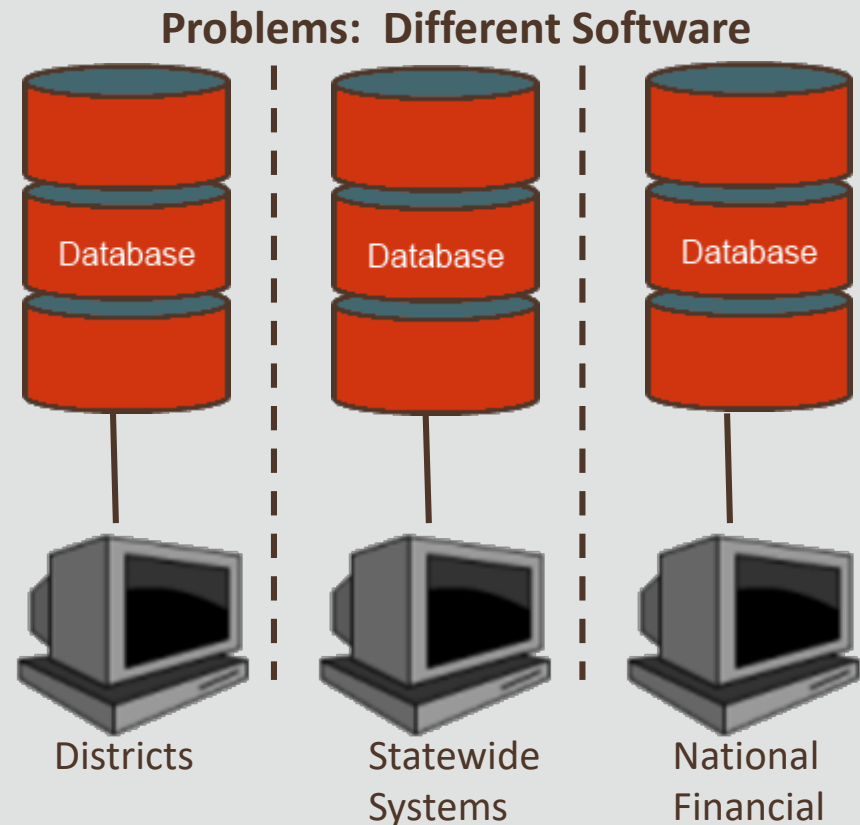
- 1980s

- 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



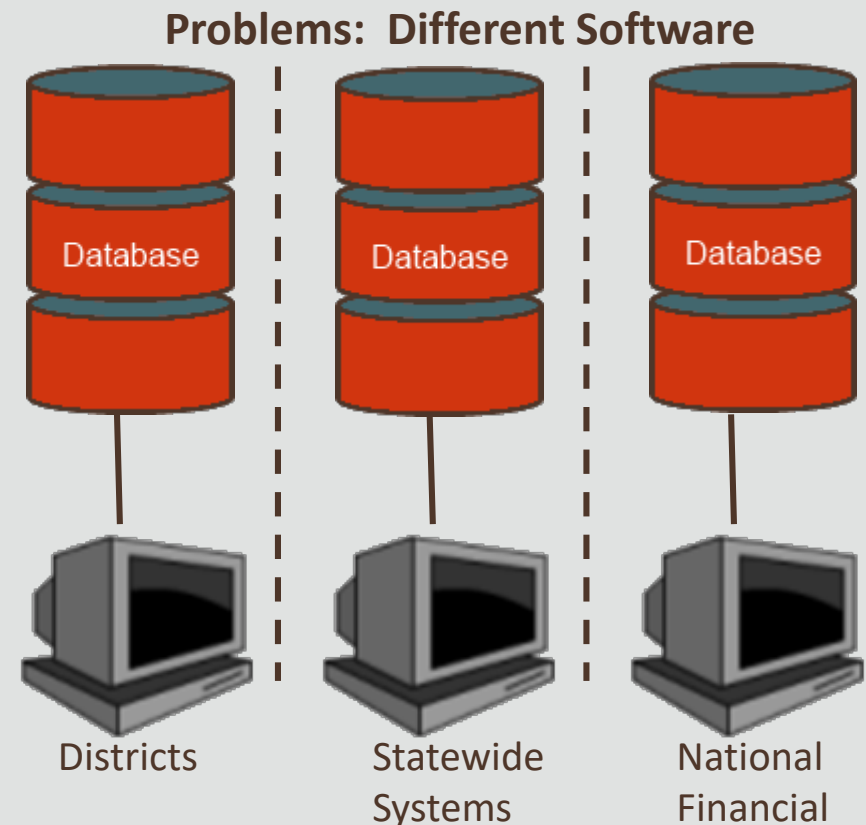
The Problem of Isolated, Nonintegrated Systems

- 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



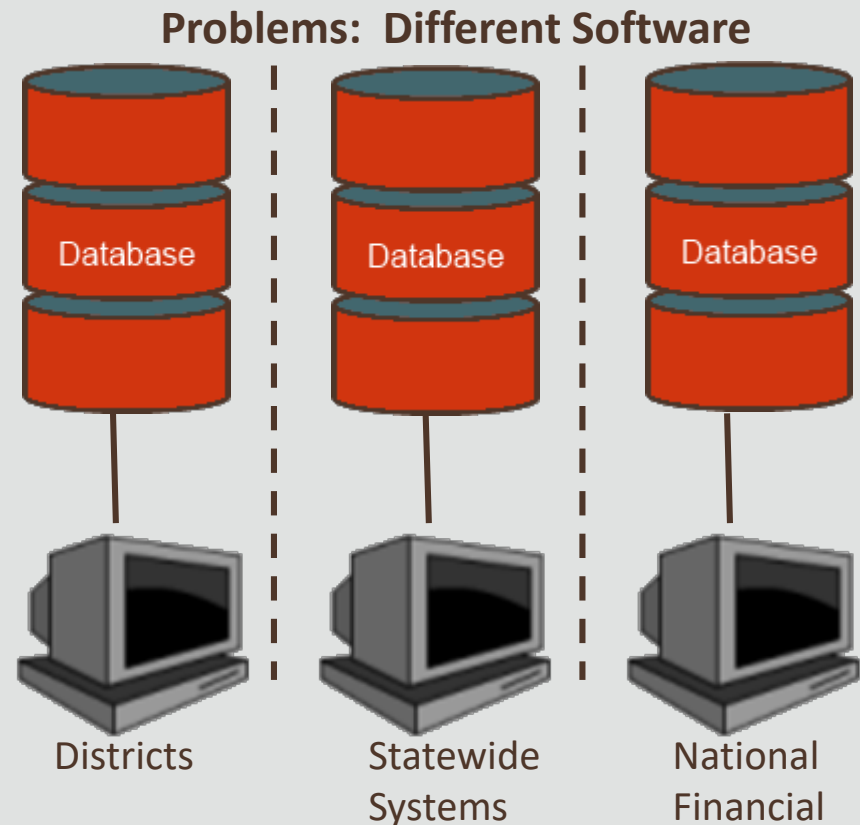
The Problem of Isolated, Nonintegrated Systems

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



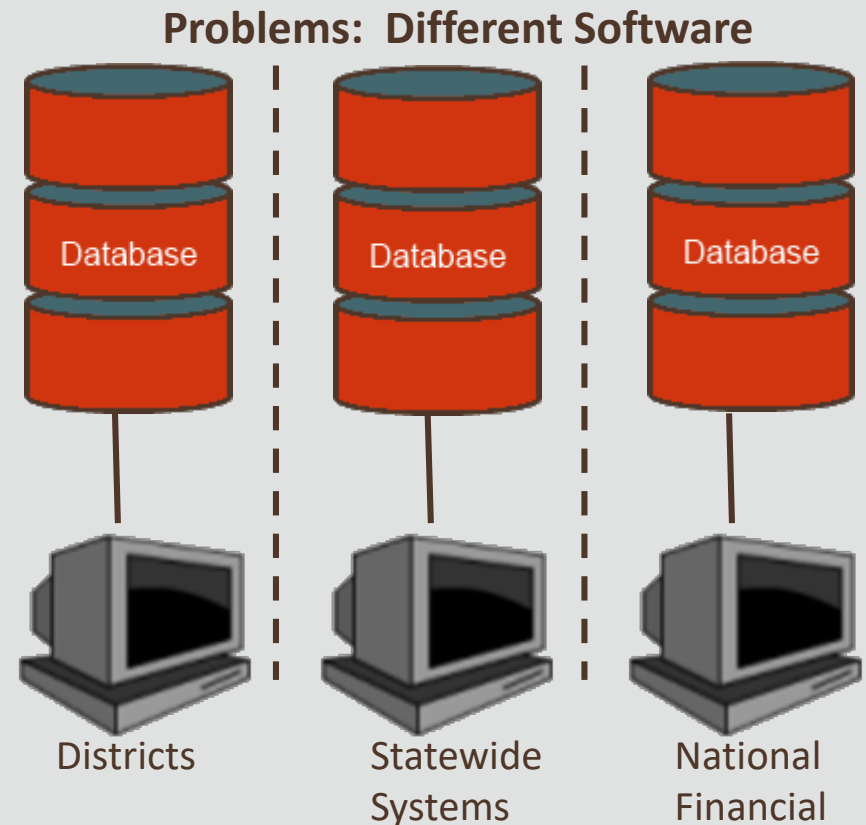
The Problem of Isolated, Nonintegrated Systems

- 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



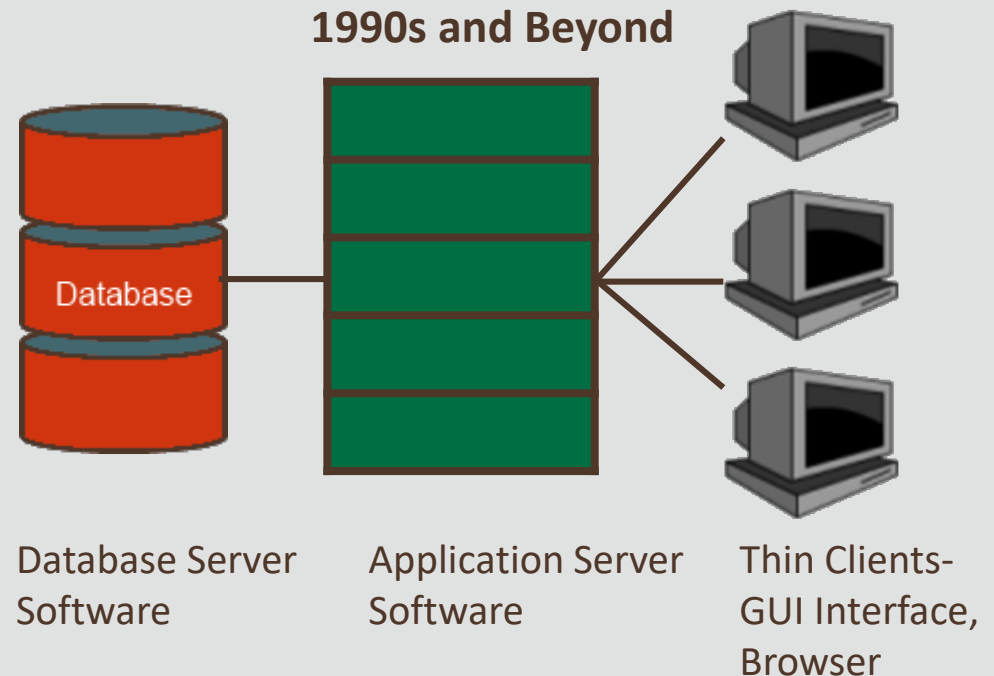
The Problem of Isolated, Nonintegrated Systems

- 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?



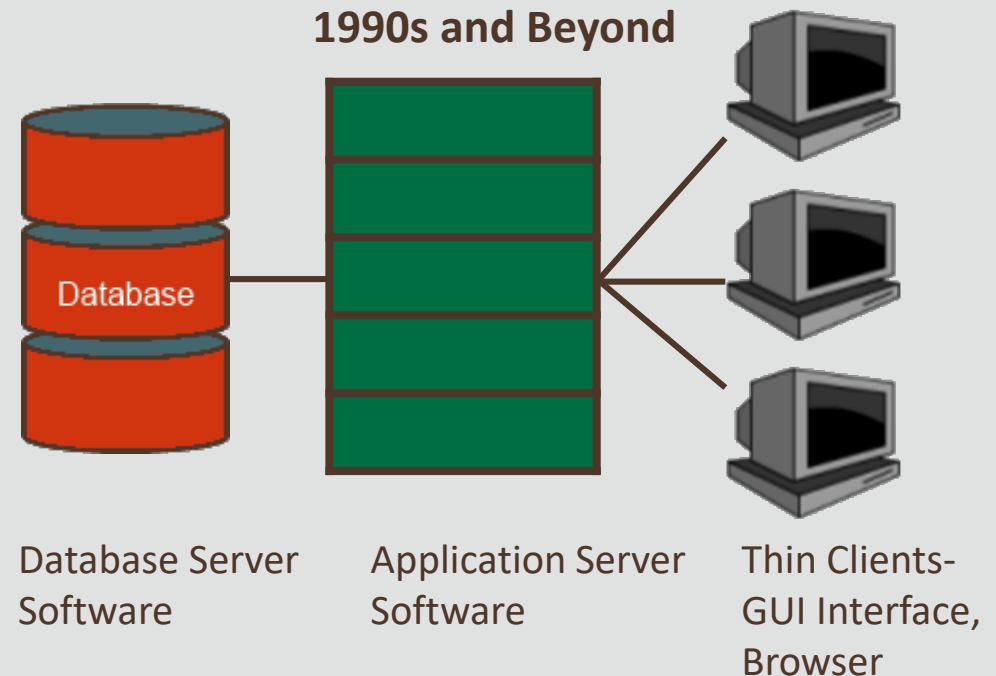
1990s and Beyond

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



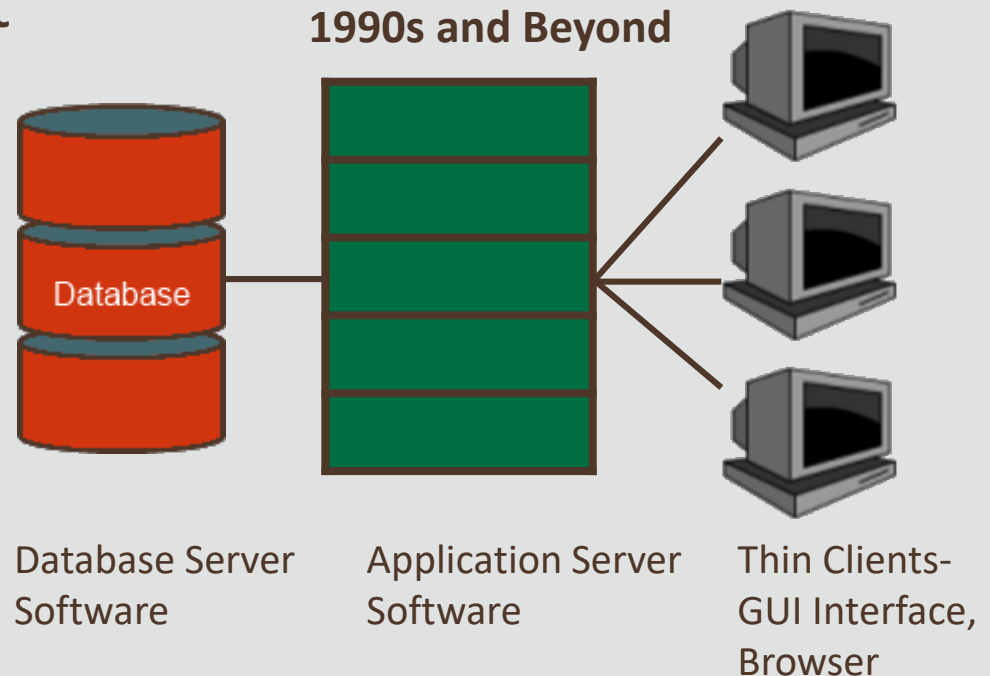
1990s and Beyond

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



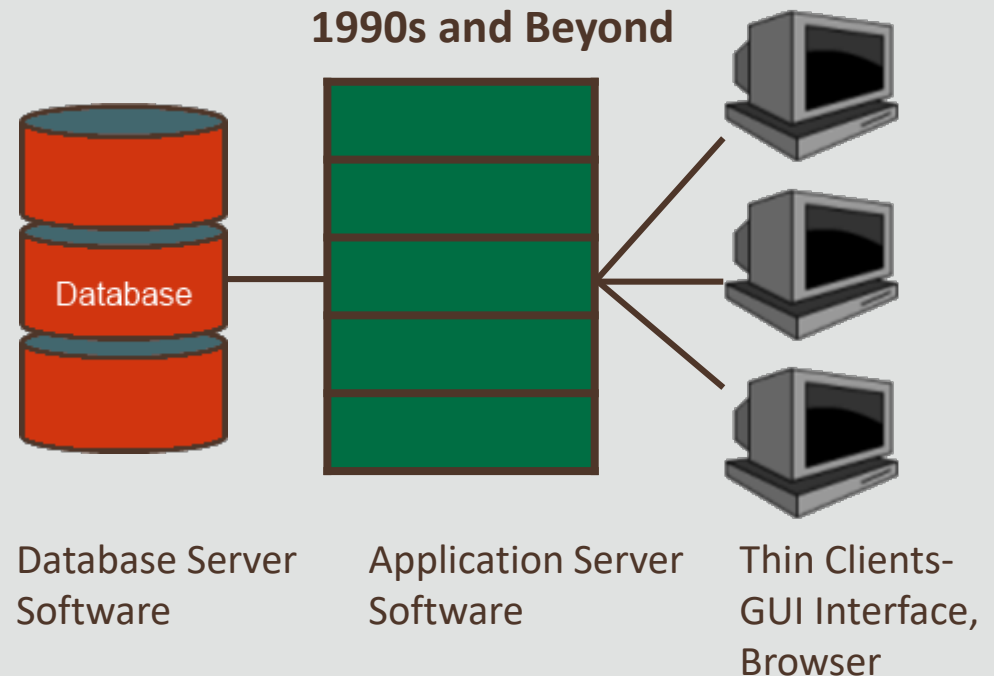
1990s and Beyond

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



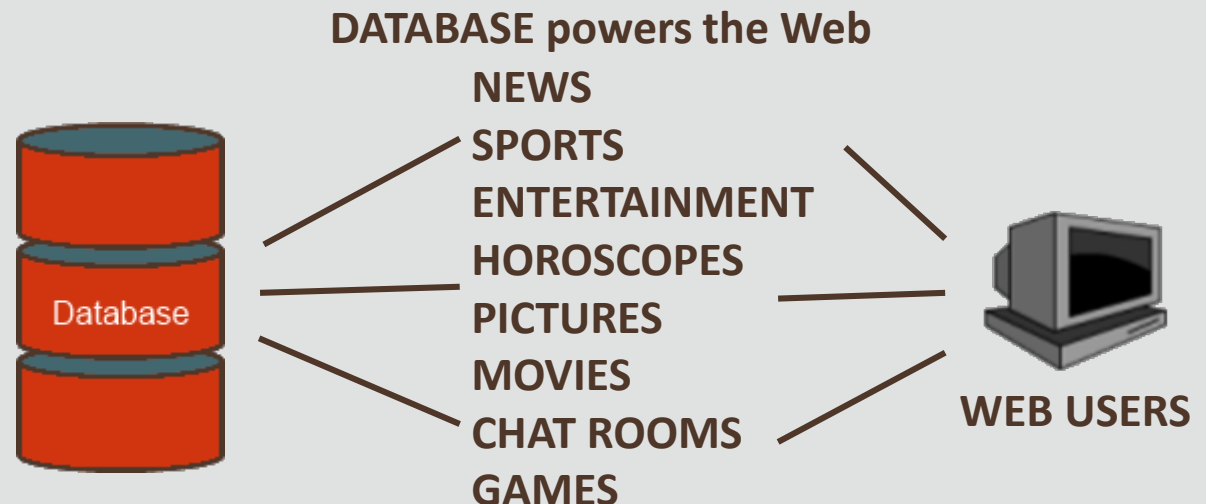
1990s and Beyond

- 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



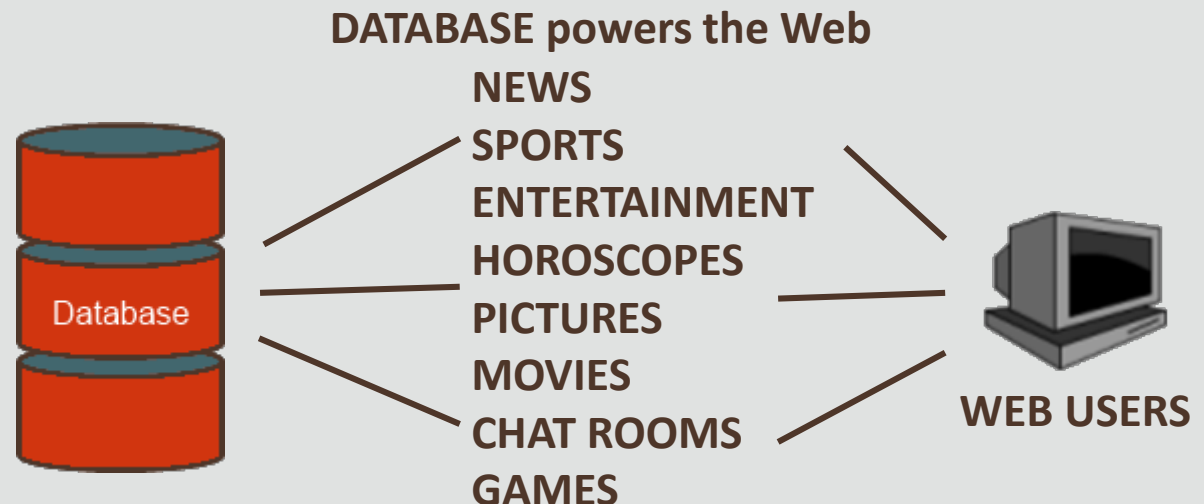
Grid Computing: A New Model

- 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



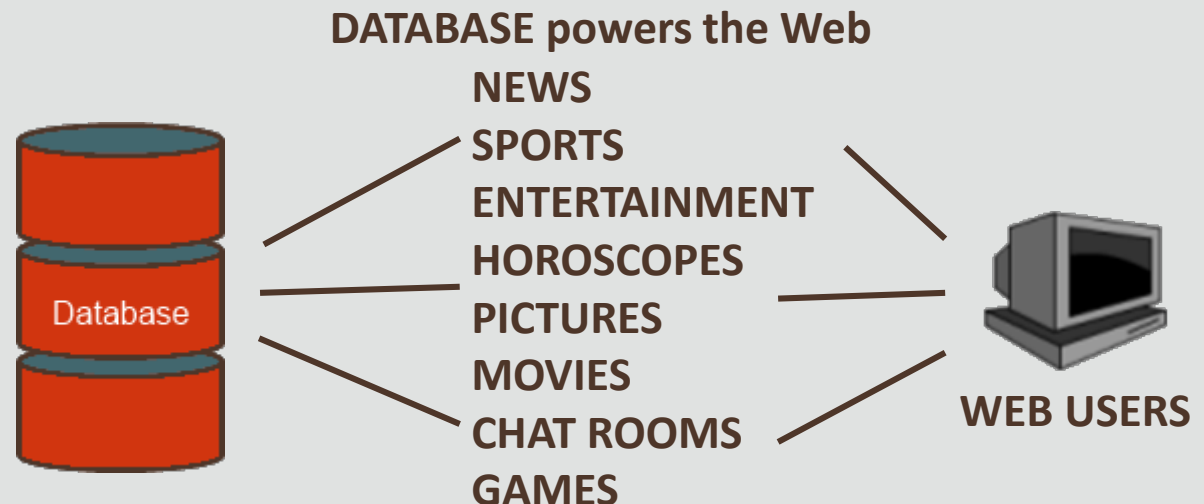
Grid Computing: A New Model

- 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



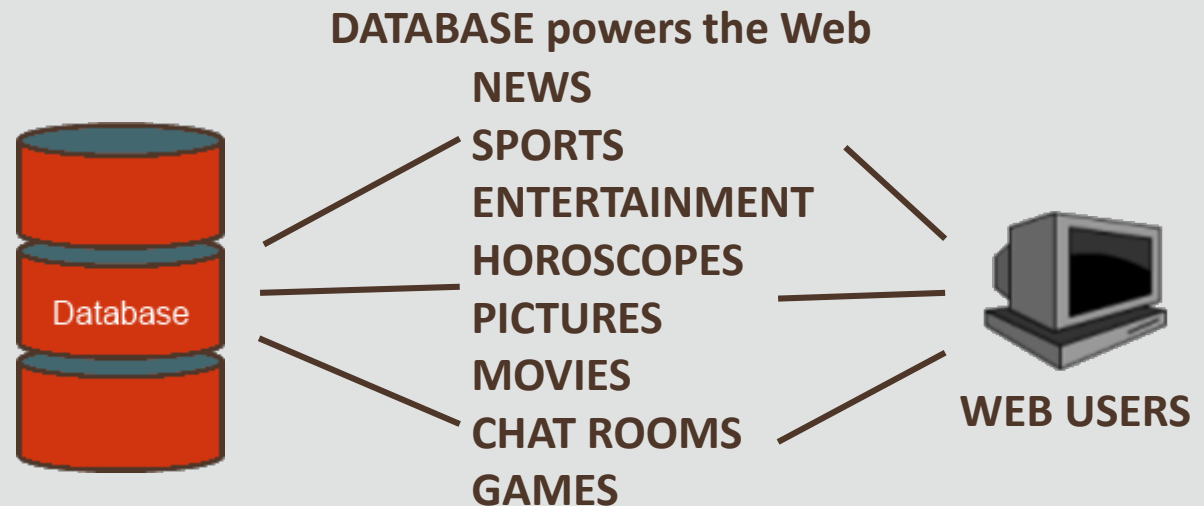
Grid Computing: A New Model

- 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



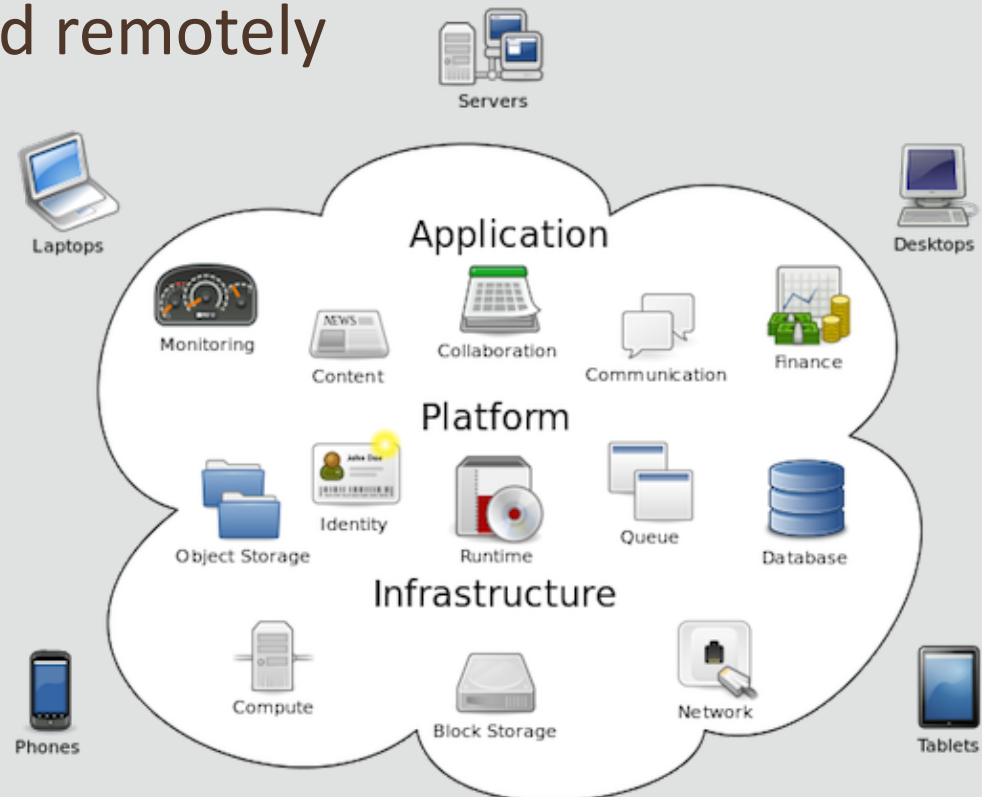
Grid Computing: A New Model

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



Cloud Computing:

- Cloud computing allows businesses to access software and hardware from a cloud provider
- These services are located remotely and delivered to users using web technologies



Databases support the operation of businesses across all sectors of industry, including:

- Finance and Banking
 - Maintaining customer records and transaction details
- Retailing
 - Stock control
- Telecommunications
 - Call logs
- Airline
 - Travel reservations

Terminology

- Key terms used in this lesson included:
 - Application
 - Client
 - Grid computing
 - Hardware
 - Infrastructure
 - Operating system

Terminology

- Key terms used in this lesson included:
 - Server
 - Software
 - Cloud Computing

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
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