


Chapter Ten

Database Management

Discovering Computers 2012
Your Interactive Guide to the Digital World



- “If you want to leave footprints in the sands of time, don’t drag your feet.”

Data vs. Information

- Data - raw facts
- Information - processed data
 - Data integrity- accuracy of data
 - Data security - protecting data

Data and Information

- What is data integrity?
 - Degree to which data is correct
 - Garbage in, garbage out (GIGO)—computer phrase that means you cannot create correct information from incorrect data



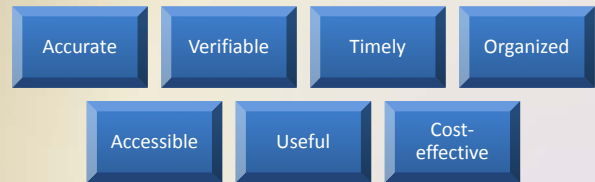
Next

Hierarchy of Data

- Bit - one binary digit
- Byte - eight bits
- Field - one or more characters (name, ssno)
- Record - collection of related fields
- File - collection of related records
- Database - collection of related files

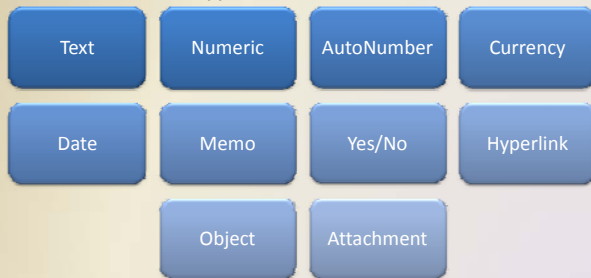
Databases, Data, and Information

- Valuable information should have the following characteristics:



The Hierarchy of Data

- Common data types include:



The Hierarchy of Data

- A **record** is a group of related fields
 - A **primary key** uniquely identifies each record
- A **data file** is a collection of related records

Address	City	State	Postal Code	E-mail Address	Date Admitted	Major	Photo
54 Lucy Court	Charlestown	IN	46176		6/10/2010	EE	mbrewer.jpg
33 Timmons Place	Bonner	IN	45208	lou@woods.com	8/9/2010	BIO	ldrake.jpg
99 Tenth Street	Sheldon	IN	46033		10/8/2010	CT	anziz.jpg
2204 Elm Court	Rowley	IN	46167	tu@ind.net	11/6/2010	GEN	btu.jpg

Arrows from the word 'fields' point to the columns: Address, City, State, Postal Code, E-mail Address, Date Admitted, Major, and Photo.

Maintaining Data

- File maintenance** refers to the procedures that keep data current

Page 520 9
Discovering Computers 2012: Chapter 10

Maintaining Data

- Validation** compares data with a set of rules or values to find out if the data is correct

Pages 522 - 524 10
Discovering Computers 2012: Chapter 10

Maintaining Data

- Validation**

- Reduce data entry errors and enhance data integrity before program writes data on disk

SAMPLE VALID AND INVALID DATA

Validity Check	Field(s) Being Checked	Valid Data	Invalid Data
Alphabetic Check	First Name	Karen	Ka24n
Numeric Check	Postal Code	46322	4tr22
Range Check	Annual Fee	\$30.00	\$120.00
Consistency Check	Date Joined and Birth Date	9/20/2007 8/27/1983	9/20/2007 8/27/2008
Completeness Check	Last Name	Tu	

Next

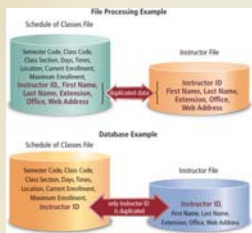
File Processing Versus Databases

Discovering Computers 2012 12

File Processing Systems vs. Database System

File processing

- Characteristics
 - Data Redundancy
 - Isolated Data



Database

- Characteristics
 - Reduced Data Redundancy
 - Improved Data Integrity
 - Shared Data
 - Easier Access
 - Reduced Development Time

DBMS

- Data Base Management System (DBMS)
 - set of programs designed to control access to the database and manage the data
 - Data dictionary
 - Data maintenance and retrieval - query language
 - Data security
 - Backup and recovery

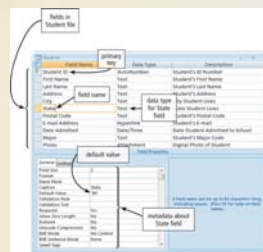
Database Management Systems

Database	Manufacturer	Computer Type
Access	Microsoft Corporation	Personal computer, server, mobile devices
Adabas	Software AG	Server, mainframe
DF	Informatica	Personal computer, server
DB2	IBM Corporation	Personal computer, server, mainframe
Exbase	Oracle Corporation	Personal computer, server, mobile devices
FileObjects	Versant Corporation	Personal computer, server
FileMaker	FileMaker, Inc.	Personal computer, server
GenFlex	GenFlex Systems	Server
Informatica	IBM Corporation	Personal computer, server, mainframe
Ingres	Ingres Corporation	Personal computer, server, mainframe
InterBase/SMP	Embarcadero Technologies	Personal computer, server
KE Ingress	KE Software, Inc.	Personal computer, server
MySQL	Oracle Corporation	Personal computer, server
ObjectStore	Progress Software Corporation	Personal computer, server
Oracle Database	Oracle Corporation	Personal computer, server, mainframe, mobile devices
SQL Server	Microsoft Corporation	Server, personal computer
SQL Server Compact Edition	Microsoft Corporation	Mobile device
Sybase	Sybase Inc.	Personal computer, server, mobile devices
Teradata Database	Teradata	Server
Versant	Versant Corporation	Personal computer, server
Visual Pathix	Microsoft Corporation	Personal computer, server

Page 527
Figure 10-11

Database Management Systems

- A **data dictionary** contains data about each file in the database and each field in those files



Pages 527 – 528
Figure 10-12

Database Management Systems

- A **query language** consists of simple, English-like statements that allow users to specify the data to display, print, or store
- **Query by example (QBE)** provides a GUI to assist users with retrieving data

Page 528

Discovering Computers 2012: Chapter 10

17

Database Management Systems

- A **form** is a window on the screen that provides areas for entering or modifying data in a database



18

Database Management Systems

- Data security

DBMS provides means to ensure only authorized users can access data

Access privileges define activities that specific user or group of users can perform

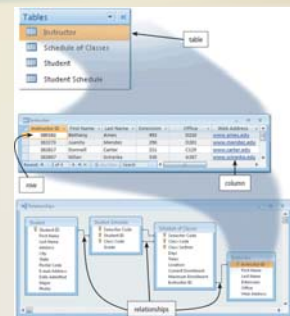
Read-only privileges - user can view data, but cannot change it

Full-update privileges - user can view and change data



Relational, Object-Oriented, and Multidimensional Databases

- A **relational database** stores data in **tables** that consist of rows and columns
 - Each **row** has a primary key
 - Each **column** has a unique name
- A **relationship** is a link within the data

Page 533
Figure 10-20

Discovering Computers 2012: Chapter 10

20

Relational, Object-Oriented, and Multidimensional Databases

- An **object-oriented database (OODB)** stores data in **objects**
- Examples of applications appropriate for an object-oriented database include:
 - Multimedia database
 - Groupware database
 - Computer-aided design database
 - Hypertext database

Page 534 Discovering Computers 2012: Chapter 10 21

Relational, Object-Oriented, and Multidimensional Databases

Page 535 Figure 10-22 Discovering Computers 2012: Chapter 10 22

Relational, Object-Oriented, and Multidimensional Databases

- A **multidimensional database** can store data in more than two dimensions of data
 - Sometimes known as a hypercube
 - Can consolidate data much faster than a relational database
- A **data warehouse** is a huge database that stores and manages the data required to analyze historical and current transactions

Pages 535 - 536 Discovering Computers 2012: Chapter 10 23

Relational, Object-Oriented, and Multidimensional Databases

- What is a **data warehouse**?
 - Huge database system that stores and manages data required to analyze historical and current transactions
 - Quick and efficient way to access large amounts of data
 - Often uses a process called data mining to find patterns and relationships among data
 - Uses multidimensional databases
 - Data mart is smaller version of data warehouse

Next

Web Databases

- Databases on the Web allow you to:

Shop for products or services	Buy or sell stocks	Search for a job
Make airline reservations	Register for college classes	Check semester grades

Page 536 Discovering Computers 2012: Chapter 10 25

Web Databases

Page 536 Discovering Computers 2012: Chapter 10 Figure 10-23 26

Database Administration

Database analysts and administrators are responsible for managing and coordinating all database activities

<p>Database Analyst (DA) Decides on proper field placement, defines data relationship, and identifies users' access privileges</p>	<p>Database Administrator (DBA) Creates and maintains the data dictionary, manages security, monitors performance, and checks backup and recovery procedures</p>
---	---

Page 538 Discovering Computers 2012: Chapter 10 27

Chapter Ten Database Management

Discovering Computers 2012
Your Interactive Guide to the Digital World
Chapter 10 Complete