Information Systems ISM 3011

Spring 2004
Unit 5A

Organizing Data and Information

Chapter 5

The Traditional Approach

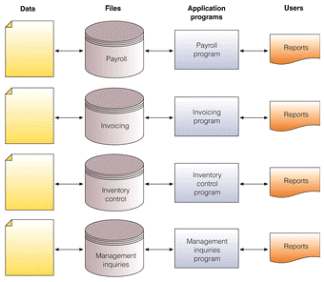


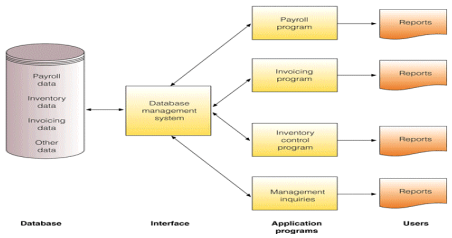
FIGURE 5-3
The Traditional Approach to Data Management
With the traditional approach, one or more data files is created and used for every application. For example, the inventory control program would have one or more files containing inventory data, such as the inventory item, number on hand, and item description. Likewise, the invoicing program can have files on customers, inventory items being shipped, and so on. With the traditional approach to data management, it is possible to have the same data, such as inventory items, in several different files used by different applications.

Traditional Approach

- Data redundancy
- Program-data dependence
- Data integrity

Database Approach

FIGURE 5-4
The Database Approach to Data Management

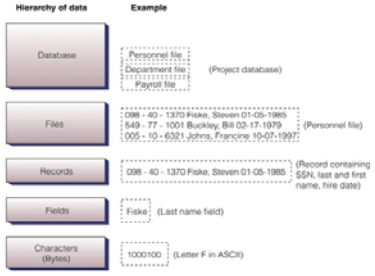


Advantages and Disadvantages of the Database Approach

→ pp. 185 / 186

The Hierarchy of Data

FIGURE 5.1
The Hierarchy of Data



Data Entities, Attributes, and Keys

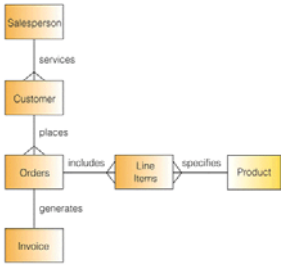
FIGURE 5.2
Keys and Attributes
The key field is the employee number. The attributes include last name, first name, hire date, and department number.

Employee #	Last name	First name	Hire date	Dept. number
005-10-6321	Johns	Francine	10-07-1997	257
549-77-1001	Buckley	Bill	02-17-1979	632
098-40-1370	Fiske	Steven	01-05-1985	598

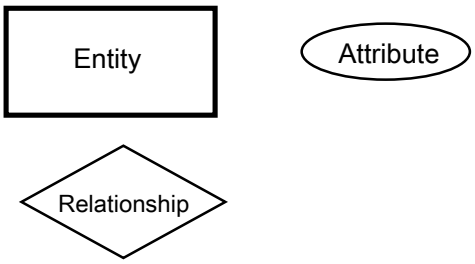
Entities (records)
Key field
Attributes (fields)

Entity-Relationship (ER) Diagrams

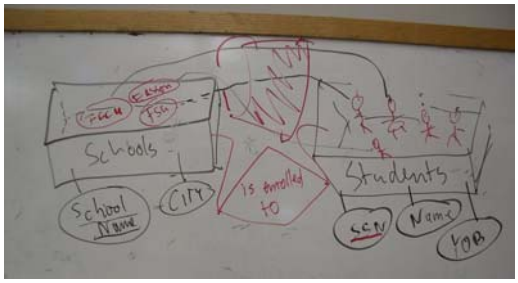
FIGURE 5.5
An Entity-Relationship (ER) Diagram for a Customer Order Database
Development of this type of diagram helps ensure the logical structuring of application programs that are able to serve users' needs and are consistent with the data relationships in the database.



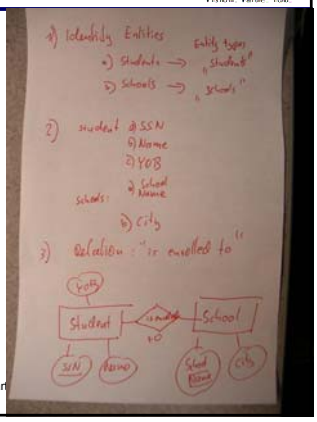
Elements of the ERM



Blackboard Picture



Blackboard Picture



Some content with kind permission of Thomson Course Technology

Relational Models

Data table 1: Project table

Project number	Description	Dept. number
155	Payroll	257
498	Widgets	632
226	Sales Manual	598

Data table 2: Department table

Dept. number	Dept. name	Manager SSN
257	Accounting	005-10-6321
632	Manufacturing	549-77-1001
598	Marketing	098-40-1370

Data table 3: Manager table

SSN	Last name	First name	Hire date	Dept. number
005-10-6321	Johns	Francine	10-07-1997	257
549-77-1001	Buckley	Bill	02-17-1979	632
098-40-1370	Fiske	Steven	01-05-1985	598

FIGURE 5.8

A Relational Database Model

In the relational model, all data elements are placed in two-dimensional tables, or relations. As long as they share at least one common element, these relations can be linked to output useful information.

Relational Models

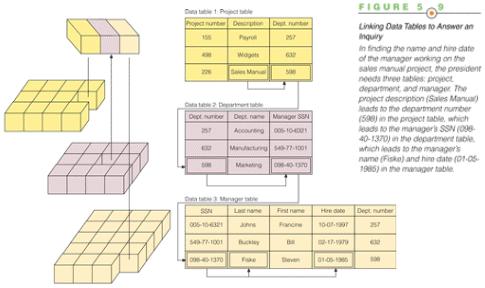


FIGURE 5.9

Linking Data Tables to Answer an Inquiry

In finding the name and hire date of the manager working on the sales manual project, the president needs three tables: project, department, and manager. The project description (Sales Manual) leads to the department number (598) in the project table, which leads to the manager's SSN (098-40-1370) in the department table, which leads to the manager's name (Fiske) and hire date (01-05-1985) in the manager table.

Database Management Systems (DBMSs)

- Provide a user view
- Create and modify the database
- Store and retrieve data
- Manipulate data
- Produce reports

Open Database Connectivity (ODBC)

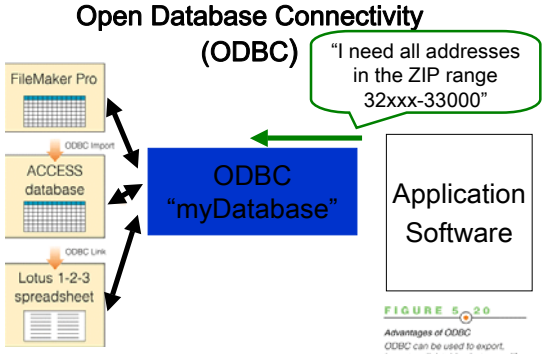


FIGURE 5.20

Advantages of ODBC

ODBC can be used to export, import, or link tables between different applications.

Storing and Retrieving Data

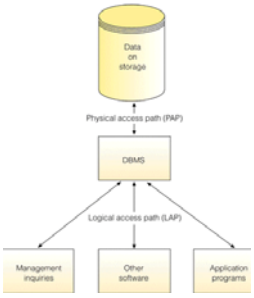


FIGURE 5.14

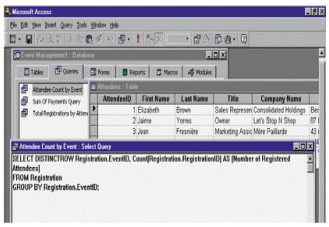
Logical and Physical Access Paths

Structured Query Language

FIGURE 5.15

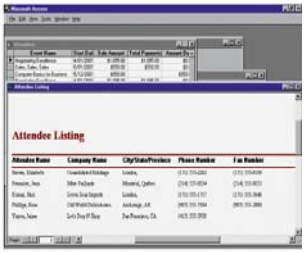
Structured Query Language

SQL has become an integral part of most relational database packages, as shown by this screen from Microsoft Access.



Database Output

FIGURE 5-16
Database Output
A database application offers sophisticated formatting and organization options to produce the right information in the right format.



Confused?

DBMS

Database

SQL

ODBC

Database

DBMS

ODBC

SQL

Summary

- **Data** - one of the most valuable resources a firm possesses
- **Entity** - a generalized class of objects for which data is collected, stored, and maintained
- **DBMS** - a group of programs used as an interface between a database and application programs
- **Traditional on-line transaction processing (OLTP)** - do not support the types of data analysis needed today

Thank you!

The slides will be available on the internet at
http://ruby.fgcu.edu/courses/mhepp/
(-> CRN10033)