

1.1 Introduction

Databases and database technology have a major impact on the growing use of computers. It is fair to say that databases play a critical role in almost all areas where computers are used, including business, electronic commerce, engineering, medicine, genetics, law, education, and library science. The word database is so commonly used that we must begin by defining what a database is our initial definition is quite general.

If you are storing important data, you have four main concerns:

- 1- Storing data needs to be quick and easy, because you're likely to do it often.
- 2- The storage medium must be reliable. You don't want to come back later and find some (or all) of your data missing.
- 3- Data retrieval needs to be quick and easy, regardless of how many items you store.
- 4- You need an easy way to separate the exact information that you want today from the tons of data that you don't want right now.

What is data?

- Data can be defined in many ways. Information science defines data unprocessed information.

What is information?

- Information is data that have been organized and communicated in a coherent and meaningful manner.

- Data is converted into information, and information is converted into knowledge.

- Knowledge is information evaluated and organized so that it can be used purposefully as shown in figure (1.1)

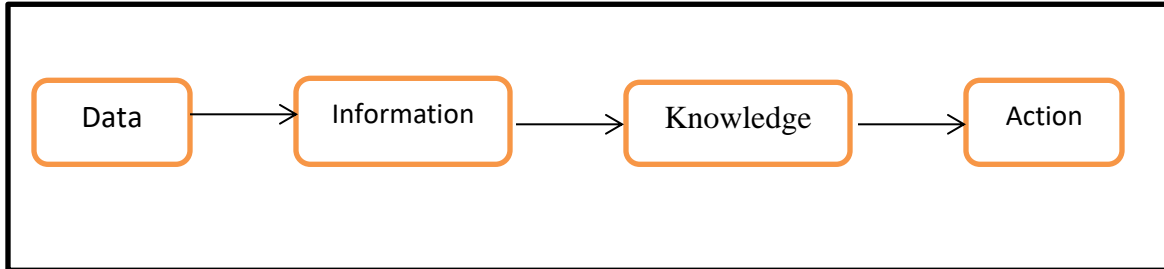


Figure (1.1)

1.2 What is a Data Base?

A database is an organized collection of data for one or more uses, typically in digital form. The data can be textual, like order or inventory data, or it can be pictures, programs or anything else that can be stored on a computer in binary form. One way of classifying databases involves the type of their contents, for example: document-text, statistical. The purpose of a database is to store and retrieve related information, so databases are designed to offer an organized mechanism for:

- 1- Storing
- 2- Managing
- 3- Retrieving information.

❖ Database Advantages:-

- 1- Reduction in data redundancy.
- 2- The ability to operate on different data structure.
- 3- Independent of data from the program.
- 4- High speed of retrieval and fast on line.
- 5- High degree of flexibility in handling data format.
- 6- Minimum cost.
- 7- Inconsistent can be avoided.

- 8- Integrity can be maintained.
- 9- Standard parameter can be enforced.
- 10-Security restriction can be applied.

❖ *Why high speed of retrieval data in database?*

- Data base using direct access.
- using Index keys.
- Data linking together one with other.
- Redundancy is existed in some time

1.3 Files System:

The File is a block of arbitrary information, it is a place that application programs stores there data in it. These application programs either database application or non-database application. Each file has a format. The information stored in the file can be organized in a record, which is a collection of fields.

The file system is typically described as various files and a number of different application programs are written to read from and add to the appropriate files.

File System Disadvantage:

- Program dependence : Each file has a format; the non-database application must know exactly the format of the file to deal with it. Any other application cannot access the file unless knowing the format of the file.
- When file format updated, then the application program must be updated, it is complicated to update all programs when data format is update.
- Security problems existed. Any one can write a program to read the data in the file.

- Data redundancy , if there are application A deals with file A and application B deals with file B, if application A store an information in file A, and if application B need this information , application B cannot access file A , so application B must record the same information in file B.

Some basic Definitions:

- Field: one category of information (one data value), i.e., Name, Address, Semester Grade, Academic topic.
- Record: Collection of fields i.e., one student's information, a recipe, a test question.
- A File: A group or collection of similar records, like student File.

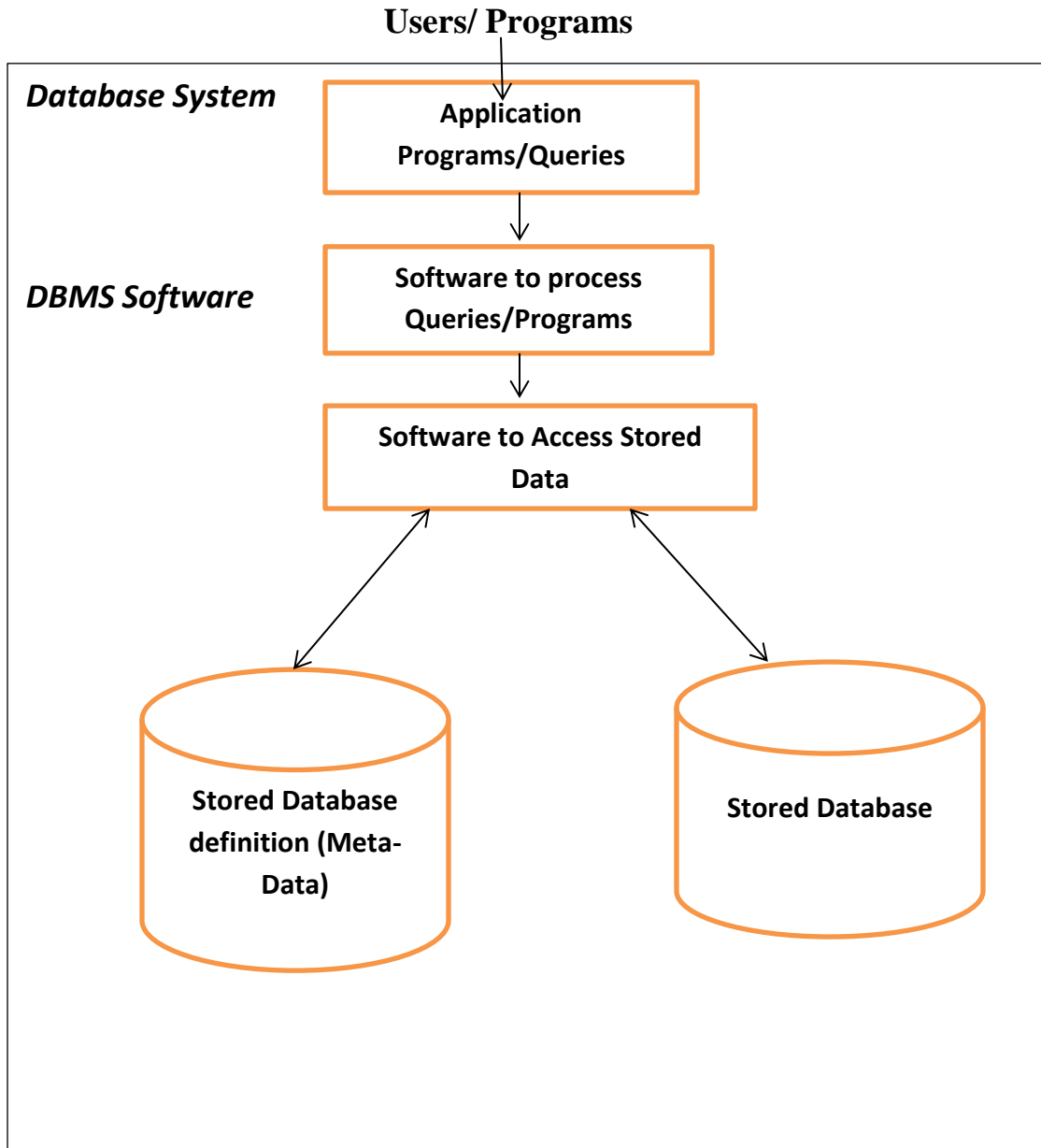


Figure (1.2) Simplified Database System environment

Digital databases are managed using database management systems (DBMS) , which store database contents, allowing data creation and maintenance, and search and other access to the database.

A database management system (DBMS) is a collection of programs that enables users to create and maintain databases and control all access to them. The primary goal of a DBMS is to provide an environment that is both convenient and efficient for users to retrieve and store information. With the database approach, we can have the traditional banking system. In this bank example, a DBMS is used by the Personnel Department, the Account Department and the Loan Department to access the shared corporate database.