SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107
An Autonomous Institution
Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-IOT Including CS&BCT
UNIT-I

PURPOSE OF DATABASE SYSTEM

The typical file processing system is supported by a conventional operating system. The system stores permanent records in various files, and it needs different application programs to extract records from, and add records to, the appropriate files.

A file processing system has a number of major disadvantages.

1.Data redundancy and inconsistency:

In file processing, every user group maintains its own files for handling its data processing applications.

Example:

Consider the UNIVERSITY database. Here, two groups of users might be the course registration personnel and the accounting office. The accounting office also keeps data on registration and related billing information, whereas the registration office keeps track of student courses and grades. Storing the same data multiple times is called data redundancy. This redundancy leads to several problems.

- ✓ Need to perform a single logical update multiple times.
- ✓ Storage space is wasted.
- ✓ Files that represent the same data may become inconsistent.

Data inconsistency is the various copies of the same data may no larger Agree.

Example:

One user group may enter a student's birth date erroneously as JAN-19-1984,

whereas the other user groups may enter the correct value of JAN-29-1984.

2.Difficulty in accessing data

File processing environments do not allow needed data to be retrieved in a convenient and efficient manner.

Example:

Suppose that one of the bank officers needs to find out the names of all customers who live within a particular area. The bank officer ha,, now two choices: cither obtain the list of all customers and extract the needed information manually or ask a system programmer to write the necessary application program. Both alternatives are obviously unsatisfactory. Suppose that such a program is written, and that, several days later, the same officer needs to trim that list to include only those customers who have an account balance of $10,000 or more. A program to generate such a list does not exist. Again, the officer has the preceding two options, neither of which is satisfactory.

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3.Data isolation

Because data are scattered in various files, and files may be in different formats, writing new application programs to retrieve the appropriate data is difficult.

4.Integrity problems

The data values stored in the database must satisfy certain types of consistency constraints.

Example:

The balance of certain types of bank accounts may never fall below a prescribed amount. Developers enforce these constraints in the system by addition appropriate code in the various application programs

5.Atomicity problems

Atomic means the transaction must happen in its entirety or not at all. It is difficult to ensure atomicity in a conventional file processing system.

Example:

Consider a program to transfer $50 from account A to account B. If a system failure occurs during the execution of the program, it is possible that the $50 was removed from account A but was not credited to account B, resulting in an inconsistent database state.

6.Concurrent access anomalies

For the sake of overall performance of the system and faster response, many systems allow multiple users to update the data simultaneously. In such an environment, interaction of concurrent updates is possible and may result in inconsistent data. To guard against this possibility, the system must maintain some form of supervision. But supervision is difficult to provide because data may be accessed by many different application programs that have not been coordinated previously.

Example: When several reservation clerks try to assign a seat on an airline flight, the system should ensure that each seat can be accessed by only one clerk at a time for assignment to a passenger.

7. Security problems

Enforcing security constraints to the file processing system is difficult