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**DATABASE MANAGEMENT SYSTEM**

**LAB ASSIGNMENT#3**

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1. **ADDITIONAL ADVANTAGES OF DATABASE APPROACH**
   1. **Expandability/flexibility**

The number of database servers in use can also be changed dynamically based on user interaction and system workload. When the workload exceeds the current capacity of the data tier, the software provisions additional database servers. When the workload drops, unused database servers can be released. The system will immediately utilize additional database servers provisioned in response to an increase in workload and adapt as database servers are released when workloads decrease.

* 1. **Reduced application development time**

The incremental time to add each new application is reduced using the database approach. Since the DBMS provides several important functions required by applications, such as concurrency control and crash recovery, high level query facilities, etc., only application-specific code needs to be written. Even this is facilitated by suites of application development tools available from vendors for many database management systems.

* 1. **Economy of scale**

By consolidating data and applications across departments, wasteful overlap of resources and personnel can be avoided through database approach.

**1.4 Centralized control by the DBA**

A database administrator (DBA) directs or performs all activities related to maintaining a successful database environment. Responsibilities include designing, implementing, and maintaining the database system; establishing policies and procedures pertaining to the management, security, maintenance, and use of the database management system; and training employees in database management and use.

1. **DATABASE SYSTEM COMPONENTS**
   1. **Data**

They are the known facts that can be recorded and have an implicit meaning. It is a very important component of the database system. Most of the organizations generate, store and process 1arge amount of data. The data acts a bridge between the machine parts i.e. hardware and software and the users which directly access it or access it through some application programs.

* 1. **Hardware**

The hardware consists of the secondary storage devices such as magnetic disks (hard disk, zip disk, floppy disks), optical disks (CD-ROM), magnetic tapes etc. on which data is stored together with the Input/output devices (mouse, keyboard, printers), processors, main memory etc. which are used for storing and retrieving the data in a fast and efficient manner. Since database can range from those of a single user with a desktop computer to those on mainframe computers with thousands of users, therefore proper care should be taken for choosing appropriate hardware devices for a required database.

* 1. **Software**

The Software part consists of DBMS which acts as a bridge between the user and the database or in other words, software that interacts with the users, application programs, and database and files system of a particular storage media (hard disk, magnetic tapes etc.) to insert, update, delete and retrieve data. For performing these operations such as insertion, deletion and updating we can either use the Query Languages like SQL, QUEL, Gupta SQL or application software, such as Visual Basic, Developer etc.

* 1. **Users**

Users are those persons who need the information from the database to carry out their primary business responsibilities i.e. Personnel, Staff, Clerical, Managers, Executives etc. On the basis of the job and requirements made by them they are provided access to the database totally or partially. They can be:

* + - Database Administrators (DBA)
    - Database Designers
    - End Users
    - Application Programmers

1. **DATA COMMUNICATION MANAGER**

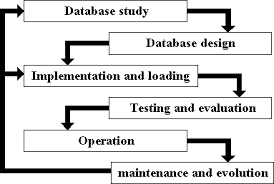
A **database/data-communications system** (DB/DC system) is a combination of a DC manager and a DBMS, in which the DBMS looks after the database and the DC manager handles all messages to and from the DBMS (or, more accurately, to and from applications that use the DBMS).The **data communications manager** (DC manager) is a software component that manages all message transmissions between the user and the DBMS (more accurately, between the user and some application running on top of the DBMS).

1. **DATABASE SYSTEM UTILITIES**

* **Loading:** A loading utility is used to load existing data files-such as text files or sequential files-into the database. Usually, the current (source) format of the data file and the desired (target) database file structure are specified to the utility, which then automatically reformats the data and stores it in the database. With the proliferation of DBMSs, transferring data from one DBMS to another is becoming common in many organizations. Some vendors are offering products that generate the appropriate loading programs, given the existing source and target database storage descriptions (internal schemas). Such tools are also called conversion tools.
* **Backup:** A backup utility creates a backup copy of the database, usually by dumping the entire database onto tape. The backup copy can be used to restore the database in case of catastrophic failure. Incremental backups are also often used, where only changes since the previous backup are recorded. Incremental backup is more complex but saves space.
* **File Reorganization:** This utility can be used to reorganize a database file into a different file organization to improve performance.
* **Performance Monitoring:** Such a utility monitors database usage and provides statistics to the DBA. The DBA uses the statistics in making decisions such as whether or not to reorganize files to improve performance.

1. **DATABASE SYSTEM LIFECYCLE**

A database is usually a fundamental component of the information system, especially in business oriented systems. Thus database design is part of system development. The following picture shows how database design is involved in the system development lifecycle.

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