**CHAPTER 1**

**INTRODUCTION**

A database management system (DBMS) [1] is system software for creating and managing [databases](http://searchsqlserver.techtarget.com/definition/database). The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage [data](http://searchdatamanagement.techtarget.com/definition/data).

A database is a collection of related data. By data, we mean known facts that can be recorded and have implicit meaning. For example, consider the names, telephone numbers, and addresses of the people, which are related data with an implicit meaning. This can be called as a database.

A DBMS makes it possible for end users to create, read, update and delete [data](http://searchdatamanagement.techtarget.com/definition/data) in a database. The DBMS essentially serves as an interface between the [database](http://searchsqlserver.techtarget.com/definition/database) and end users or [application programs](http://searchsoftwarequality.techtarget.com/definition/application-program), ensuring that data is consistently organized and remains easily accessible.

The DBMS manages three important things they are:

* The data
* The database [engine](http://whatis.techtarget.com/definition/engine) ,that allows data to be accessed , locked and modified
* The database [schema](http://searchsqlserver.techtarget.com/definition/schema), which defines the database’s logical structure.

These three foundational elements help provide [concurrency](http://searchoracle.techtarget.com/definition/concurrent-processing), security, [data integrity](http://searchdatacenter.techtarget.com/definition/integrity) [2] and uniform administration procedures. Typical database administration tasks supported by the DBMS include [change management](http://searchcio.techtarget.com/definition/change-management), performance monitoring or tuning and [backup](http://searchstorage.techtarget.com/definition/backup) and [recovery](http://searchstorage.techtarget.com/definition/recovery). Many database management systems are also responsible for automated [rollbacks](http://searchsqlserver.techtarget.com/definition/rollback), restarts and recovery as well as the [logging](http://whatis.techtarget.com/definition/log-log-file) and [auditing](http://searchcio.techtarget.com/definition/audit-trail) of activity.

The DBMS is perhaps most useful for providing a centralized view of data that can be accessed by multiple users, from multiple locations, in a controlled manner. A DBMS can limit what data the end user sees, as well as how that end user can view the data, providing many views of a single database schema. End users and software programs are free from having to understand where the data is physically located or on what type of storage media it resides because the DBMS handles all requests.

The DBMS can offer both logical and physical data independence. This means this can protect users and applications from needing to know where data is stored or having to be concerned about changes to the physical structure of data ([storage](http://searchstorage.techtarget.com/definition/storage) and hardware). As long as programs use the application programming interface ([API](http://searchexchange.techtarget.com/definition/application-program-interface)) for the database that is provided by the DBMS, developers won't have to modify programs just because changes have been made to the database.

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 use, including business, electronic commerce, engineering, medicine, genetics, law, education, and library science.

A database management system (DBMS) is a collection of programs that enables users to create and maintain a database. The DBMS is a general purpose software system that facilitates the processes of defining, constructing, manipulating, and sharing databases among various users and applications. Defining a database involves specifying the data types, structures, and constraints of the data to be stored in the database.

The database definition or descriptive information is also stored by the DBMS in the form of a database catalogue or dictionary; it is called meta-data. Constructing the database is the process of storing the data on some storage medium that is controlled by the DBMS.

Manipulating a database includes functions such as querying the database to retrieve specific data, updating the database to reflect changes in the mini world, and generating reports from the data. Sharing a database allows multiple users and programs to access the database simultaneously. An application program accesses the database by sending queries or requests for data to the DBMS. A query typically causes some data to be retrieved.

**1.1 Types of databases**

In this section, Different types of databases have been discussed, they are:

1. Centralised database
2. Operational database
3. End-user database
4. Commercial database
5. Personal database
6. Distributed database

**1.1.1 Centralised database**

Users from different locations can access this database from a remote location at the central database, that store entire information and application programs at a central computing facility for processing. The application programs pick up the appropriate data from the database based on the transactions sent by the communications controller for processing the transaction.

Data validation and verification is carried out by the application programs at the central computer centre, and a registration number is allotted by the application programs located at the central facility. The local area office keeps on recording it and hardly does any processing.

**1.1.2 Operational database**

This is more of a basic form of data that contain information relating to the operations of an enterprise. Generally, such databases are organised on functional lines such as marketing, production, employees, etc.

**1.1.3 End user database**

End user is the user of software, application or a product. This is a shared database which is shared by users and is meant for use by the end users, just like managers at different levels. They may not be concerned about the individual transactions as found in operational databases. End User database is more about the summary of the information.

**1.1.4 Commercial database**

This is a database that contains information which external users may require. However, they will not be able to afford maintaining such huge database by them. It is an paid service to the user as the databases are subjected specific. The access to commercial database can be given through commercial links.

Some of the database service providers also offer databases on CD-ROMs and the updated versions of the databases are made available periodically. The databases on CD-ROMs have the advantage of reduced cost of communication.

**1.1.5 Personal database**

The personal databases are maintained, generally, on personal computers. They contain information that is meant for use only among a limited number of users, generally working in the same department.

**1.1.6 Distributed database**

These databases have contributions from the common databases as well as the data captured from the local operations. The data remains distributed at various sites in the organisation. As the sites are linked to each other with the help of communication links, the entire collection of data at all the sites constitutes the logical database of the organisation.

*Human Resource Database Management System (HRDMS)* creates software that stores and manages all the data needed to describe the personal and their framework within an organization. It includes definition of various levels of hierarchy in an organization, the salary structure pertaining to every element in this hierarchy, the description of every department functioning in the organization and the overall employ database which integrates elements in all the aforementioned.

HRDMS has a database administration that has access to the entire database, in regards with viewing and update of information. The exclusive right is implemented using authorized access. Also viewing all data and editing of personal data can be done by any employee, this also using authorized access. Communication between personal and administrator has also been provided.

The data can be accessed, manipulated and retrieved very easily. The interface has been made very user friendly. The data is well protected for use and the data processing i.e., results of query functions has been made very quick and efficient.

The Human Resource Database Management software is very user friendly and appealing. The Human objective of the system is to maintain and retrieve information about the entire personnel framework of the organizational system. The system is fairly simple in design and implementation.

**1.2 OBJECTIVES**

The Human Resource Database Management software is very user friendly and appealing. The Human objective of the system is to maintain and retrieve information about the entire personnel framework of the organizational system. The system is fairly simple in design and implementation

The main objectives of the proposed system can be summarized as follows:

* Design of hierarchical framework in terms of positions held thus depicting the organizational hierarchy. Update of the structure of the same, as well as addition of new elements.
* Search for all employees, departments, dependent information etc possible. Also department-wise, level-wise and other parameter based search enabled.
* Communication between employee and administrator.
* Computerized payroll generation, manipulation and management.
* Easy management of databases of various sections covering key aspects.

**1.3 GOALS OF THE PROPOSED SYSTEM**

In this section, different types of goals of the proposed systems have been discussed they are:

* **Planned approach toward working:** The working in the organization will be well planned and organized. The data will be stored efficiency with optimal disk space consumption in data stores which will help in retrieval of information as well as its storage under resource constraints.
* **Accuracy:** The level of accuracy in the proposed system will be higher. All operations would conform to integrity constraints and correctness and it will be ensured that whatever information is received at or sent from the centre is accurate.
* **Reliability:** The reliability of the proposed system will be high due to the above mentioned reasons. This comes from the fact that only the data which conforms accuracy clause would be allowed to commit back to the disk. Other properties like transaction management and rollback during system or power failure etc get automatically taken care of by the SQL systems, which is undoubtedly an excellent choice of the DBMS system. Properties of atomicity, consistency, isolation and data security are intrinsically maintained.
* **No redundancy:** In the proposed system,the care has been taken to ensure that no repetition of information occurs, neither on a physical storage nor on a logical implementation level. This economizes on resource utilization in terms of storage space. Also even in case of concurrent access no anomalies occur and consistency is maintained. In addition to all this, principles of normalization have been endeavoured to be followed.
* **Immediate retrieval of information:** The main objective of the proposed system is to provide a quick and efficient platform for retrieval of information. Among the queries allowed for use by the user, the query results are made available immediately, without time lapse, irrespective of the complexity of the query.
* **Ease of operation:** The system should be simplistic in design and use. It is such that it can be easily developed within a short period of time and can conform to the financial and resource-related constraints of the organization.

**1.3 Summary**

In this chapter, the brief introduction regarding the DBMS has been discussed, followed by objectives. In the next chapter the concept of front end design has been dealt.