Northern India Engineering College, Shastri Park, New Delhi

**Department of Information Technology**

**Fundamentals of Computing (Code ETCS – 111)**

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**Introduction to DBMS**

**Define Database Management System (DBMS)**

A database management system (DBMS) is a software package designed to define, manipulate, retrieve and manage data in a database. A DBMS generally manipulates the data itself, the data format, field names, record structure and file structure. It also defines rules to validate and manipulate this data. A DBMS relieves users of framing programs for data maintenance. Fourth-generation query languages, such as SQL, are used along with the DBMS package to interact with a database.

## Simply a collection of [programs](http://www.webopedia.com/TERM/P/program.html) that enables you to [store](http://www.webopedia.com/TERM/S/store.html), modify, and extract information from a [database](http://www.webopedia.com/TERM/D/database.html). There are many different types of DBMSs, ranging from small [systems](http://www.webopedia.com/TERM/S/system.html) that [run](http://www.webopedia.com/TERM/R/run.html) on [personal computers](http://www.webopedia.com/TERM/P/personal_computer.html) to huge systems that run on [mainframes](http://www.webopedia.com/TERM/M/mainframe.html). The following are examples of [database applications](http://www.webopedia.com/TERM/D/database_management_system_DBMS.html):

**Advantages of DBMS:**

* More info from the same data
* Reduction of data duplication
* Improved data integrity
* Programs are independent of the data format
* Sharing of data resources

**Disadvantages of DBMS:**

* Added expense
* More hardware may be needed
* If it crashes….
* Sophisticated design and programming required
* Additional training
* Security is critical

**Data Base Administrator**

A database administrator (short form DBA) is a person responsible for the [installation](http://en.wikipedia.org/wiki/Installation_%28computer_programs%29), [configuration](http://en.wikipedia.org/wiki/Computer_configuration), [upgrade](http://en.wikipedia.org/wiki/Upgrade), [administration](http://en.wikipedia.org/wiki/System_administrator), [monitoring](http://en.wikipedia.org/wiki/System_Monitoring) and [maintenance](http://en.wikipedia.org/wiki/Software_maintenance) of [databases](http://en.wikipedia.org/wiki/Databases) in an organization.

The role includes the [development](http://en.wikipedia.org/wiki/Software_development) and [design](http://en.wikipedia.org/wiki/Design) of database [strategies](http://en.wikipedia.org/wiki/Strategy), [system monitoring](http://en.wikipedia.org/wiki/System_monitoring) and improving database [performance](http://en.wikipedia.org/wiki/Computer_performance) and [capacity](http://en.wikipedia.org/wiki/Capacity_management), and [planning](http://en.wikipedia.org/wiki/Planning) for future expansion requirements. They may also plan, [co-ordinate](http://en.wikipedia.org/wiki/Cooperation) and [implement](http://en.wikipedia.org/wiki/Implementation_%28computer_science%29) [security](http://en.wikipedia.org/wiki/Computer_security) measures to safeguard the database.

**What are the attributes of data?**

* Sharable
* Moveable
* Secure
* Accurate
* Timely
* Relevant

**DBMS vs File System**

DBMS (Database Management System) and File System are two ways that could be used to manage, store, retrieve and manipulate data. A File System is a collection of raw data files stored in the hard-drive whereas DBMS is a bundle of applications that is dedicated for managing data stored in databases. It is the integrated system used for managing digital databases, which allows the storage of database content, creation/ maintenance of data, search and other functionalities. Both systems can be used to allow the user to work with data in a similar way. A File System is one of the earliest ways of managing data. But due the shortcomings present in using a File System to store electronic data, Database Management Systems came in to use sometime later, as they provide mechanisms to solve those problems. But it should be noted that, even in a DBMS, data are eventually (physically) stored in some sort of files.

**Difference between DBMS and File System**

In File System, files are used to store data while, collections of databases are utilized for the storage of data in DBMS. Although File System and DBMS are two ways of managing data, DBMS clearly has many advantages over File Systems. Typically when using a File System, most tasks such as storage, retrieval and search are done manually and it is quite tedious whereas a DBMS will provide automated methods to complete these tasks. Because of this reason, using a File System will lead to problems like data integrity, data inconsistency and data security, but these problems could be avoided by using a DBMS. Unlike File System, DBMS are efficient because reading line by line is not required and certain control mechanisms are in place.