ST. XAVIER’S COLLEGE

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**Database Management System**

**Lab Assignment #3**

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**2.Components of DBMS**

A database management system (DBMS) consists of several components. Each component plays very important role in the database management system environment. The major components of database management system are:

* Software
* Hardware
* Data
* Users

**Software**

The main component of a DBMS is the software. It is the set of programs used to handle the database and to control and manage the overall computerized database

1. DBMS software itself, is the most important software component in the overall system
2. Operating system including network software being used in network, to share the data of database among multiple users.
3. Application programs developed in programming languages such as C++, Visual Basic that are used to to access database in database management system. Each program contains statements that request the DBMS to perform operation on database. The operations may include retrieving, updating, deleting data etc . The application program may be conventional or online workstations or terminals.

**Hardware**

Hardware consists of a set of physical electronic devices such as computers (together with associated I/O devices like disk drives), storage devices, I/O channels, electromechanical devices that make interface between computers and the real world systems etc, and so on. It is impossible to implement the DBMS without the hardware devices, In a network, a powerful computer with high data processing speed and a storage device with large storage capacity is required as database server.

**Data**

Data is the most important component of the DBMS. The main purpose of DBMS is to process the data. In DBMS, databases are defined, constructed and then data is stored, updated and retrieved to and from the databases. The database contains both the actual (or operational) data and the metadata (data about data or description about data).

**Users**

The users are the people who manage the databases and perform different operations on the databases in the database system.There are three kinds of people who play different roles in database system

1. Application Programmers
2. Database Administrators
3. End-Users

**Application Programmers**

The people who write application programs in programming languages (such as Visual Basic, Java, or C++) to interact with databases are called Application Programmer.

**Database Administrators**

A person who is responsible for managing the overall database management system is called database administrator or simply DBA.

**End-Users**

The end-users are the people who interact with database management system to perform different operations on database such as retrieving, updating, inserting, deleting data etc.[2]

**3.Data communications manager**

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 :

Load existing data files

* Backup

Creates a backup copy of the database

* Database storage reorganization

Reorganize a set of database files into different file organizations

* + Performance monitoring

Monitors database usage and provides statistics to the DBA

**5.Classification of DBMS**

* Based on the data model used
* Traditional: Relational, Network, Hierarchical.
  + Emerging: Object-oriented, Object-relational.
* Other classifications
  + Single-user (typically used with personal computers)  
    vs. multi-user (most DBMSs).
  + Centralized (uses a single computer with one database)   
    vs. distributed (uses multiple computers, multiple databases)

1. **Database system lifecycle**

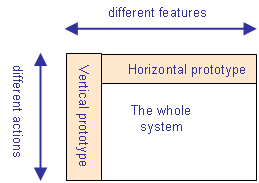
Stages of database system development lifecycle:

* Application design
* Prototyping (optional)
* Implementation
* Data conversion and loading
* Testing
* Operational maintenance.
* Application Design

In the application design phase, the design of the user interface and the application programs that use and process the database are defined and designed.

* Protyping

The purpose of a prototype is to allow the users to use the prototype to identify the features of the system using the computer. There are horizontal and vertical prototypes. A horizontal prototype has many features (e.g. user interfaces) but they are not working. A vertical prototype has very few features but they are working. See the following picture.



* Implementation

During the implementation phase, the physical realization of the database and application designs are to be done. This is the programming phase of the systems development.

* Operational Maintenance

The operational maintenance is the process of monitoring and maintaining the database system.  
  
Monitoring means that the performance of the system is observed. If the performance of the system falls below an acceptable level, tuning or reorganization of the database may be required.  
  
Maintaining and upgrading the database system means that, when new requirements arise, the new development lifecycle will be done.

* Data Conversion and Loading

This phase is needed when a new database is replacing an old system. During this phase the existing data will be transferred into the new database.

* Testing

Before the new system is going to live, it should be thoroughly tested. The goal of testing is to find errors! The goal is not to prove the software is working well.

**References :**

[1]<http://www2.amk.fi/digma.fi/www.amk.fi/opintojaksot/0303011/1142845462205/1142847774995/1142849037295/1143037341377.html> ,3rd August,2015.

[2]” <http://computer-dbms.blogspot.com/2011/09/components-of-dbms.html>”, 3rd August,2015.

[3]”