Difference between DBMS and RDBMS

Although DBMS and RDBMS both are used to store information in physical database but there are some remarkable differences between them.

The main differences between DBMS and RDBMS are given below:

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| **No.** | **DBMS** | **RDBMS** |
| 1) | DBMS applications store **data as file**. | RDBMS applications store **data in a tabular form**. |
| 2) | In DBMS, data is generally stored in either a hierarchical form or a navigational form. | In RDBMS, the tables have an identifier called primary key and the data values are stored in the form of tables. |
| 3) | **Normalization is not** present in DBMS. | **Normalization is** present in RDBMS. |
| 4) | DBMS does **not apply any security** with regards to data manipulation. | RDBMS **defines the integrity constraint** for the purpose of ACID (Atomocity, Consistency, Isolation and Durability) property. |
| 5) | DBMS uses file system to store data, so there will be **no relation between the tables**. | in RDBMS, data values are stored in the form of tables, so a **relationship** between these data values will be stored in the form of a table as well. |
| 6) | DBMS has to provide some uniform methods to access the stored information. | RDBMS system supports a tabular structure of the data and a relationship between them to access the stored information. |
| 7) | DBMS **does not support distributed database**. | RDBMS **supports distributed database**. |
| 8) | DBMS is meant to be for small organization and **deal with small data**. it supports **single user**. | RDBMS is designed to **handle large amount of data**. it supports **multiple users**. |
| 9) | Examples of DBMS are file systems, **xml**etc. | Example of RDBMS are **mysql**, **postgre**, **sql server**, **oracle** etc. |

## Explain the difference between DBMS and RDBMS.

1. **DBMS:**  
     
   - A DBMS is a storage area that persist the data in files. To perform the database operations, the file should be in use.  
   - Relationship can be established between 2 files.  
   - There are limitations to store records in a single database file depending upon the database manager used.  
   - DBMS allows the relations to be established between 2 files.  
   - Data is stored in flat files with metadata.  
   - DBMS does not support client / server architecture.  
   - DBMS does not follow normalization. Only single user can access the data.  
   - DBMS does not impose integrity constraints.  
   - ACID properties of database must be implemented by the user or the developer  
     
   **2) RDBMS:**  
     
   - RDBMS stores the data in tabular form.  
   - It has additional condition for supporting tabular structure or data that enforces relationships among tables.  
   - RDBMS supports client/server architecture.  
   - RDBMS follows normalization.  
   - RDBMS allows simultaneous access of users to data tables.  
   - RDBMS imposes integrity constraints.  
   - ACID properties of the database are defined in the integrity constraints.

Network Database Model

*What is a Database Model?*

                A database model is a structure or a format of a database.

*There are three types of database model that is widely used:*

*1.)*    *Network Database Model*

2.)    [Hierarchical Database Model](http://www.computerbusinessresearch.com/Home/database/hierarchical-database-model)

3.)    [Relational Database Model](http://www.computerbusinessresearch.com/Home/database/relational-database-model)

*Within a database there are three types of relationships they can have among them:*

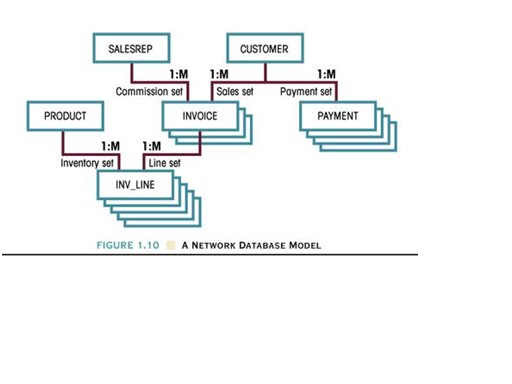
1.)    [One-Many relationship](http://www.onlamp.com/pub/a/onlamp/2001/03/20/aboutSQL.html)

2.)    [Many-Many relationship](http://en.wikipedia.org/wiki/Many-to-many_(data_model))

3.)    [One-One relationship](http://www.onlamp.com/pub/a/onlamp/2001/03/20/aboutSQL.html)

*Definition of Network Database Model*

            A network database model is a database model that allows multiple records to be linked to the same owner file. The model can be seen as an upside down tree where the branches are the member information linked to the owner, which is the bottom of the tree. The multiple linkages which this information allows the network database model to be very flexible. In addition, the relationship that the information has in the network database model is defined as many-to-many relationship because one owner file can be linked to many member files and vice versa.

[](http://www.computerbusinessresearch.com/Home/database/network-database-model/188.bmp?attredirects=0)

*History*

            The network database model was invented by Charles Bachman in 1969 as an enhancement of the already existing database model, the hierarchical database model. Because the hierarchical database model was highly flaw, Bachman decided to create a database that is similar to the hierarchical database but with more flexibility and less defaults. The original and existing hierarchical database has one owner file linked strictly to one member file, creating a ladder affect that restricted the database to find relationships outside of its category.

*Network Database vs. Hierarchical Database Model*

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| --- | --- |
| **Network Database Model** | **Hierarchical Database Model** |
| Many-to-many relationship | One-to-many relationship |
| Easily accessed because of the linkage between the information | Difficult to navigate because of its strict owner to member connection |
| Great flexibility among the information files because the multiple relationships among the files | Less flexibility with the collection of information because of the hierarchical position of the files |

*Network Database vs. Hierarchical Database Model*

|  |  |
| --- | --- |
| **Network Database Model** | **Relational Database Model** |
| The files are greatly related | Information is stored on separate tables tied together with other clumps of information |

*Advantages of a Network Database Model*

-          Because it has the many-many relationship, network database model can easily be accessed in any table record in the database

-          For more complex data, it is easier to use because of the multiple relationship founded among its data

-          Easier to navigate and search for information because of its flexibility

*Disadvantage of a Network Database Model*

-          Difficult for first time users

-          Difficulties with alterations of the database because when information entered can alter the entire database

**DBMS Functions'**

                There are several functions that a DBMS performs to ensure data integrity and consistency of data in the database. The ten functions in the DBMS are: data dictionary management, data storage management, data transformation and presentation, security management, multiuser access control, backup and recovery management, data integrity management, database access languages and application programming interfaces, database communication interfaces, and transaction management.

**1.**Data Dictionary Management

Data Dictionary is where the DBMS stores definitions of the data elements and their relationships (metadata).  The DBMS uses this function to look up the required data component structures and relationships. When programs access data in a database they are basically going through the DBMS. This function removes structural and data dependency and provides the user with data abstraction. In turn, this makes things a lot easier on the end user. The Data Dictionary is often hidden from the user and is used by Database Administrators and Programmers.

**2.**Data Storage Management

                This particular function is used for the storage of data and any related data entry forms or screen definitions, report definitions, data validation rules, procedural code, and structures that can handle video and picture formats. Users do not need to know how data is stored or manipulated. Also involved with this structure is a term called performance tuning that relates to a database’s efficiency in relation to storage and access speed.

**3.**Data Transformation and Presentation

            [    This function exists to transform any data entered into required data structures. By using the data transformation and presentation function the DBMS can determine the difference between logical and physical data formats.

**4.**Security Management

                This is one of the most important functions in the DBMS. Security management sets rules that determine specific users that are allowed to access the database. Users are given a username and password or sometimes through biometric authentication (such as a fingerprint or retina scan) but these types of authentication tend to be more costly. This function also sets restraints on what specific data any user can see or manage.

**5.**Multiuser Access Control

                Data integrity and data consistency are the basis of this function. Multiuser access control is a very useful tool in a DBMS, it enables multiple users to access the database simultaneously without affecting the integrity of the database.

**6.**Backup and Recovery Management

                Backup and recovery is brought to mind whenever there is potential outside threats to a database. For example if there is a power outage, recovery management is how long it takes to recover the database after the outage. Backup management refers to the data safety and integrity; for example backing up all your mp3 files on a disk.

**7.**Data Integrity Management

                The DBMS enforces these rules to reduce things such as data redundancy, which is when data is stored in more than one place unnecessarily, and maximizing data consistency, making sure database is returning correct/same answer each time for same question asked.

**8.**Database Access Languages and Application Programming Interfaces

                A query language is a nonprocedural language. An example of this is SQL (structured query language). SQL is the most common query language supported by the majority of DBMS vendors. The use of this language makes it easy for user to specify what they want done without the headache of explaining how to specifically do it.

**9.**Database Communication Interfaces

                This refers to how a DBMS can accept different end user requests through different network environments. An example of this can be easily related to the internet.  A DBMS can provide access to the database using the Internet through Web Browsers (Mozilla Firefox, Internet Explorer, Netscape).

'*10.*Transaction Management

This refers to how a DBMS must supply a method that will guarantee that all the updates in a given transaction are made or not made.All transactions must follow what is called the ACID properties.

**A – Atomicity: states a transaction is an indivisible unit that is either performed as a whole and not by its parts, or not performed at all.It is the responsibility of recovery management to make sure this takes place.**

C – Consistency:A transaction must alter the database from one constant state to another constant state. I – Isolation:Transactions must be executed independently of one another.Part of a transaction in progress should not be able to be seen by another transaction. D – Durability:A successfully completed transaction is recorded permanently in the database and must not be lost due to failures**.**