**1.2 What is a database management system?**

While a database is a repository of data, a ***database management system***, or simply DBMS, is a set of software tools that control access, organize, store, manage, retrieve and maintain data in a database. In practical use, the terms database, database server, database system, data server, and database management systems are often used interchangeably.

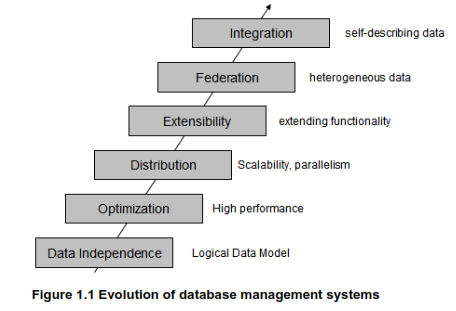
Why do we need database software or a DBMS? Can we not just store data in simple text files for example? The answer lies in the way users access the data and the handle of corresponding challenges. First, we need the ability to have multiple users insert, update and delete data to the same data file without "stepping on each other's toes". We also need to have a standard interface for data access, tools for data backup, data restore and recovery, and a way to handle other challenges such as the capability to work with huge volumes of data and users. Database software has been designed to handle all of these challenges.

The most mature database systems in production are relational database management systems (RDBMS’s). RDBMS's serve as the backbone of applications in many industries including banking, transportation, health, and so on.

**1.2.1 The evolution of database management systems**

In the 1960s, network and hierarchical systems such as CODASYL and IMSTM **were** the state-of-the-art technology for automated banking, accounting, and order processing systems enabled by the introduction of commercial mainframe computers. While these systems **provided** a good basis for the early systems, their basic architecture **mixed** the physical manipulation of data with its logical manipulation. When the physical location of data changed, such as from one area of a disk to another, applications had to be updated to reference the new location.

A revolutionary paper by E.F. Codd, an IBM San Jose Research Laboratory employee in 1970, **changed** all that. The paper titled *“A relational model of data for large shared data banks”* **introduced** the notion of data independence, which separated the physical representation of data from the logical representation presented to applications. Data could be moved from one part of the disk to another or stored in a different format without causing applications to be rewritten. Application developers were freed from the tedious physical details of data manipulation, and could focus instead on the logical manipulation of data in the context of their specific application.



IBM's System R was the first system to implement Codd's ideas. System R was the basis for SQL/DS, which later became DB2. It also had the merit to introduce SQL, a relational database language used as a standard today, and to open the door for commercial database management systems. Originally, the language was termed “Structured English Query Language” or SEQUEL, but it was later changed to SQL as SEQUEL was a registered trademark of a UK based company.

SQL was adopted as a standard language in 1986 by the ***American National Standards Institute*** (***ANSI***) and by the ***International Standards Organization*** (***ISO***) in 1987. Since its standardization, SQL standards have been updated six times. The last update was in 2008 and is popularly referred as SQL:2008.

Today, relational database management systems are the most used DBMS's and are developed by several software companies. IBM is one of the leaders in the market with DB2 database server. Other relational DBMS's include Oracle, Microsoft SQL Server, INGRES, PostgreSQL, MySQL, and dBASE.

(from: Database Fundamentals by Neera Sharma. Canadá, 2010)

**EJERCICIO 1. Antes de leer el texto.**

**Estos son los dos títulos del texto anterior:**

***The evolution of database management systems***

***What is a database management system?***

* **¿Qué información espera que contenga cada parte?**

**Definición de sistemas de gestión de base de datos, explicaciones sobre lo que son y lo que hacen.**

**Historia de cómo fueron cambiando estos sistemas.**

* **¿En qué tiempo estarán los verbos en cada una? ¿En presente, pasado o futuro?**

**La primera parte en presente.**

**La segunda parte en pasado y presente.**

**EJERCICIO 2. Lea el texto, corrija o confirme lo anterior y coloque los títulos donde corresponda.**

**EJERCICIO 3. Lea el punto 1.2 e indique en qué parte el texto presenta lo siguiente:**

|  |  |
| --- | --- |
| *1. Una explicación* | ¿Sobre qué? **Sobre por qué es necesario usar un software para administrar las bases de datos** |
| *2. Definiciones* | ¿De qué? **Base de datos y sistema de gestión de base de datos** |
| *3. Información específica* | ¿Sobre qué? **Sobre sistemas de bases de datos relacionales** |
| *4. Sinónimos de un término* | ¿De cuál? **De sistema de gestión de base de datos** |

**EJERCICIO 4. Busque la siguiente información en el texto y desarróllela en español.**

1. Ámbitos en que se usan las bases de datos relacionales: **muchas industrias como por ejemplo los sistemas bancarios, de trasporte, de salud.**

2. Términos que se utilizan en forma alternativa: **base de datos, servidor de base de datos, sistema de base de datos, servidor de datos, sistemas de gestión de bases de datos.**

3. Funciones del sistema de gestión de bases de datos: **controla el acceso a la base de datos, organiza, almacena, maneja, recupera y mantiene los datos en la base de datos.**

4. Algunos desafíos que el software de base de datos puede manejar: **que varios usuarios accedan a los datos (inserten, actualicen y borren datos) al mismo tiempo sin interferir unos con otros, tener una interfaz estándar para el acceso al os datos, herramientas para el backup, la restauración y recuperación de datos, la capacidad de trabajar con grandes volúmenes de datos y de usuarios.**