Fundamentals of DBMS

(DSM 1006)

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What is Data?

- Irrespective of specific industries, **data** has become the *driving force* that furthers the development of a variety of technologies.

- Data etymologically derives from the Latin word "**datum**" which roughly translates to "*something given*".

- Data is raw, unorganized, unanalyzed, uninterrupted, and unrelated used in different contexts.

- For instance, facts and stats gathered by researchers for their analysis can collectively be called data.

What is Information?

- Data in essence lacks its informative fervor and relatively renders itself to be meaningless unless given a purpose or direction to acquire its significance.

- When that data is *analyzed*, *structured*, and given *composure* or *context* to make it useful, it is referred to as **information**.

- Information etymologically dates back to its Middle and Old french roots, which meant “the act of informing,” mostly used in the context of knowledge, instruction, and education.

- In essence, information is systematic, filtered, and useful.

Database Management System

- A *database* is a suite of structured files on a computer that are organized in such a way that information can be accessed in a structured manner.

- It's difficult to go to the bank, shop at a store, or surf the World Wide Web without encountering a database.

- Databases are efficient storage houses of information that can make information available in just about any way imaginable.

DBMS versus Database

- A database *management system* is a different thing from a database.
- It's the system that makes a database appear out of what's essentially just a bunch of files on a computer disk.
- It creates a "window" through which you can look, making those files look like structured information.
- It runs queries on the tables, putting data in and getting data out

DBMS versus Database

- DBMS is a system *manages* a database, or indeed several databases.

- This means more than just processing queries: It implies a system doing many more tasks, like:
  - ✓controlling access to databases
  - ✓performing administration tasks
  - ✓logging activity
  - ✓managing runtime resources (such as memory and disk usage) etc.

RDBMS

- Idea of a relational database management system (RDBMS) was conceived in the early 1970s
- Databases have evolved from being ways to store data electronically to cornerstones of many business operations.
- RDBMS is so useful that they are now integrated into the workflow of almost every organization.
- In many cases, an RDBMS is an organization's most valuable intangible asset

Common Characteristics of DBMS ?

- ✓It uses a digital repository established on a server to store and manage the information.
- ✓It can provide a clear and logical view of the process that manipulates data.
- ✓DBMS contains automatic backup and recovery procedures.
- ✓It contains ACID properties which maintain data in a healthy state in case of failure.
- ✓It can reduce the complex relationship between data.
- ✓It is used to support manipulation and processing of data.
- ✓It is used to provide security of data.
- ✓It can view the database from different viewpoints according to the requirements of the user.

Advantages of DBMS

- ✓**Controls database redundancy:** It can control data redundancy because it stores all the data in one single database file and that recorded data is placed in the database.
- ✓**Data sharing:** In DBMS, the authorized users of an organization can share the data among multiple users.
- ✓**Easily Maintenance:** It can be easily maintainable due to the centralized nature of the database system.
- ✓**Reduce time:** It reduces development time and maintenance need.
- ✓**Backup:** It provides backup and recovery subsystems which create automatic backup of data from hardware and software failures and restores the data if required.
- ✓**Multiple user interface:** It provides different types of user interfaces like graphical user interfaces, application program interfaces

Disadvantages of DBMS

- ✓**Cost of Hardware and Software:** It requires a high speed of data processor and large memory size to run DBMS software.
- ✓**Size:** It occupies a large space of disks and large memory to run them efficiently.
- ✓**Complexity:** Database system creates additional complexity and requirements.
- ✓**Higher impact of failure:** Failure is highly impacted the database because in most of the organization, all the data stored in a single database and if the database is damaged due to electric failure or database corruption then the data may be lost forever.

Any Questions?

Floor is Open for Discussion ....

References & Acknowledgements

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