

# Fundamental of Database System DBMS

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# Definition

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- ▶ “Database Management System(DBMS) A DBMS is a complex set of software programs that controls the organization, storage, management, and retrieval of data in a database.”[2]

# Advantages of a DBMS

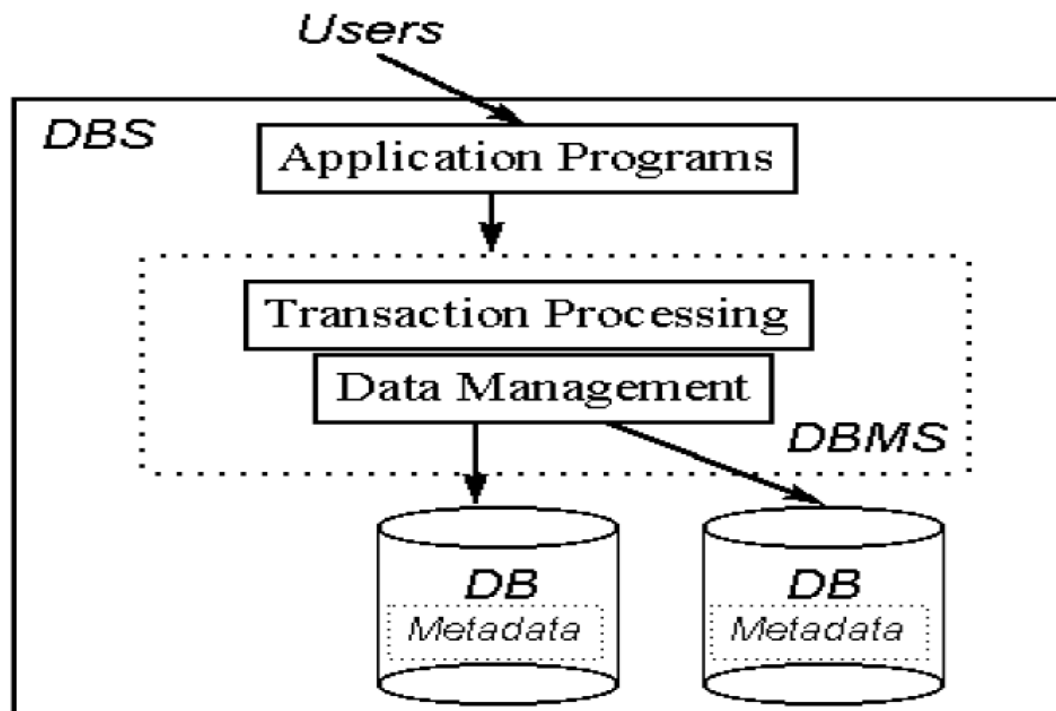
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1. Data Consistency and Integrity - by controlling access and minimizing data duplication
2. Application program independence - by storing data in a uniform fashion
3. Data Sharing - by controlling access to data items, many users can access data concurrently
4. Backup and Recovery
5. Security and Privacy

# DB Systems Contains:

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- A. The Database;
- B. The DBMS; and
- C. Application Programs (what users interact with)



# Actors of Database Systems

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1. End users
2. DB designers
3. DB administrators
4. Application programmers

# Features and Capabilities of DBMS

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1. Query Ability
2. Backup
3. Rule Enforcement
4. Security
5. Computation
6. Change and Access Logging

# Query Ability

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- ▶ Querying is the process of requesting attribute information from various perspectives and combinations of factors.
- ▶ For example how many students have taken 340 score from Kabul province in Kankor examination?
- ▶ A database query language and report writer allow users to interactively interrogate the database, analyze its data and update it according to the users privileges on data.

# Data Security

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- ▶ Data security prevents unauthorized users from viewing or updating the database.



# Backup

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- ▶ Copies of attributes need to be made regularly in case primary disks or other equipment fails.
- ▶ DBMS usually provide utilities to facilitate the process of extracting and disseminating attribute sets.

# Rule Enforcement

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- ▶ Often one wants to apply rules to attributes so that the attributes are clean and reliable. For example, we may have a rule that says each car can have only one engine associated with it (identified by Engine Number).

# Security

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- ▶ Often it is desirable to limit who can see or change a given attributes or groups of attributes in database.
- ▶ Through the assignment of individuals and groups to roles which are then granted entitlements.

# Computation

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- ▶ There are common computations requested on attributes such as counting, summing, averaging, sorting, grouping, cross-referencing, etc. Rather than have each computer application implement these from scratch, they can rely on the DBMS to supply such calculations.
- ▶ All arithmetical work to perform by computer is called a computation.

# Change and Access Logging

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- ▶ Often one wants to know who accessed what attributes, what was changed, and when it was changed. Logging services allow this by keeping a record of access occurrences and changes.

# List of DBMS Software

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- ▶ Oracle
- ▶ DB2
- ▶ Sybase Adaptive Server Enterprise
- ▶ FileMaker
- ▶ Firebird
- ▶ Ingres
- ▶ Informix
- ▶ Microsoft Access
- ▶ Microsoft SQL Server
- ▶ Microsoft Visual FoxPro
- ▶ MySQL
- ▶ PostgreSQL
- ▶ Progress
- ▶ SQLite
- ▶ Teradata
- ▶ CSQL
- ▶ OpenLink Virtuoso

# Any

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Question?

