# Database Management System (DBMS)

## Lecture-7

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# Database System Structure

A database system is partitioned into modules that deal with each of the responsibilities of the overall system. The functional components of a database system can be broadly divided into the storage manager and the query processor components.

1. Storage Manager
2. Query Processor

## Storage Manager

A storage manager is a program module that provides the interface between the low level data stored in the database and the application programs and queries submitted to the system. The storage manager is responsible for storing, retrieving, and updating data in the database. The components of storage manager includes the following modules:

# Storage Manager(cont.)

**Authorization and integrity manager:** It checks the integrity constraints and the authority of users to access data.

**Transaction manager:** It ensures that the database remains in a consistent (correct) state despite system failures, and that concurrent transaction executions proceed without conflicting.

**File manager:** It manages the allocation of space on disk storage and the data structures used to represent information stored on disk.

**Buffer manager:** It is responsible for fetching data from disk storage into main memory, and deciding what data to cache in main memory. The buffer manager is a critical part of the database system, since it enables the database to handle data sizes that are much larger than the size of main memory.

## Storage Manager(cont.)

The storage manager implements several data structures as part of the physical system implementation:

- **Data files,** which store the database itself.
- **Data dictionary,** which stores metadata about the structure of the database, in particular the schema of the database.
- **Indices,** which provide fast access to data items that hold particular values.

## Query Processor

The query processor includes the following components:-

**DDL interpreter:** It interprets DDL statements and records the definitions in the data dictionary.

**DML compiler:** It translates DML statements in a query language into an evaluation plan consisting of low-level instructions that the query evaluation engine understands. The DML compiler also performs query optimization.

**Query evaluation engine:** It executes low-level instructions generated by the DML compiler.

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