1 Concepts (cont.)

A DBMS has 3 purposes: to define, manipulate, and provide access to the database.

Database applications have 2 purposes: to query and modify/update the database.

Columns are *attributes*. Rows are *entities*. Table names are *relations*.

DBMS Catalog stores not only the data, but also metadata about them.

2 Characteristics of the DB approach

• Data Abstraction: hide the implementation details. Give users a conceptual view of the data and its relations. Allow changes without other levels of conceptualization needing to be aware.

• Self-describing data (metadata).

• Support for multiple views of the data.

3 Database users

• Actors of the scene: people who use the DB, including those who create applications for it.

• Workers behind the scene: people who built the DBMS.

4 Architecture

A data model has *concepts*, *operations* (transactions, queries, updates) and *constraints* (datatypes and values that are legal; can or can't be null, must have a unique ID etc.)

Data models can be *conceptual*, *physical* or *self-describing*.

Database schema: structure

Database state: a snapshot of the DB at a particular moment in time

The Three-Schema Architecture:

• End-users are at the external level (with external views.)

• Conceptual level: conceptual schema (first name, last name, address, phone number...)

• Internal level: internal schema (Strings, floating-point numbers, integers, booleans etc.), linked to the binary form of the data stored in memory.