D

Database

M. Tamer Özsu
Cheriton School of Computer Science,
University of Waterloo, Waterloo, ON, Canada

Definition

A database is a *structured* and *persistent* collection of information about some aspect of the real world organized and stored in a way that facilitates efficient retrieval and modification. The structure of a database is determined by an abstract data model. Primarily, it is this structure that differentiates a database from a data file. The most popular data model is relational that represents data as a set of tables. The database includes instances of entities and the relationships among them. For example, a database for a school may contain instances of students, professors, courses, which students take which courses, which professors teach which courses, etc.

Historical Background

The term “database” was introduced in the 1960s, and the field has grown steadily since then. As of this writing, the database market is over US\$50 billion and growing. In the early days, the term was used interchangeably with “data bank” and

“data base,” but now the general convention is to use the term as defined here.

Key Applications

Database applications span almost all of the fields where large volumes of data are collected and managed. The emergence of “big data” applications has broadened the use of databases.

Cross-References

- [Data Definition](#)
- [Database Management System](#)
- [Database Schema](#)
- [Relational Model](#)

Recommended Reading

1. Elmasri R, Navathe S. Fundamentals of database systems, 7th edn. Pearson; 2016.
2. Silberschatz A, Korth HF, Sudarshan S. Database system concepts, 6th edn. McGraw-Hill; 2010.
3. Ramakrishnan R, Gehrke J. Database management systems, 3rd edn. McGraw-Hill; 2002.