

Book Chapter 1 - Databases and Database Users

- * Storage structures and search techniques: Indexes help speed up query performance; generally based on tree data structures or hash data structures. Indexes are copied from disk to main memory.
- * Buffering / caching: Maintains parts of the database in main memory buffers. Most DBMS do their own.
 \Rightarrow DBs must be able to represent/handle complex relationships between data
- * Enforcing integrity constraints: restrictions on data, like types, uniqueness, etc.
- * Referential integrity: A record in one file must be related to records in other files
- * Uniqueness: every record for a column must be unique
- * Actions Using Rules and Triggers:
- * Triggers: Form of a rule activated by updates on a table
- * Stored procedures: Database functions for some action
 \Rightarrow Benefits of database approach: potential for enforcing standards, reduced app dev time, flexibility, up-to-date information, economics of scale
- * Early Databases: Based on three main paradigms: hierarchical systems, network model-based systems, and inverted file systems.
- * Relational databases: separate physical storage from conceptual representation
 \Rightarrow Basic relational databases are not suitable for other types of applications. Time series, large data storage, complex data types.

Summary: DBs improve speed through indexing, which implements tree algorithms. DBs also use buffering and caching to handle indexing. DBs also need to implement constraints.