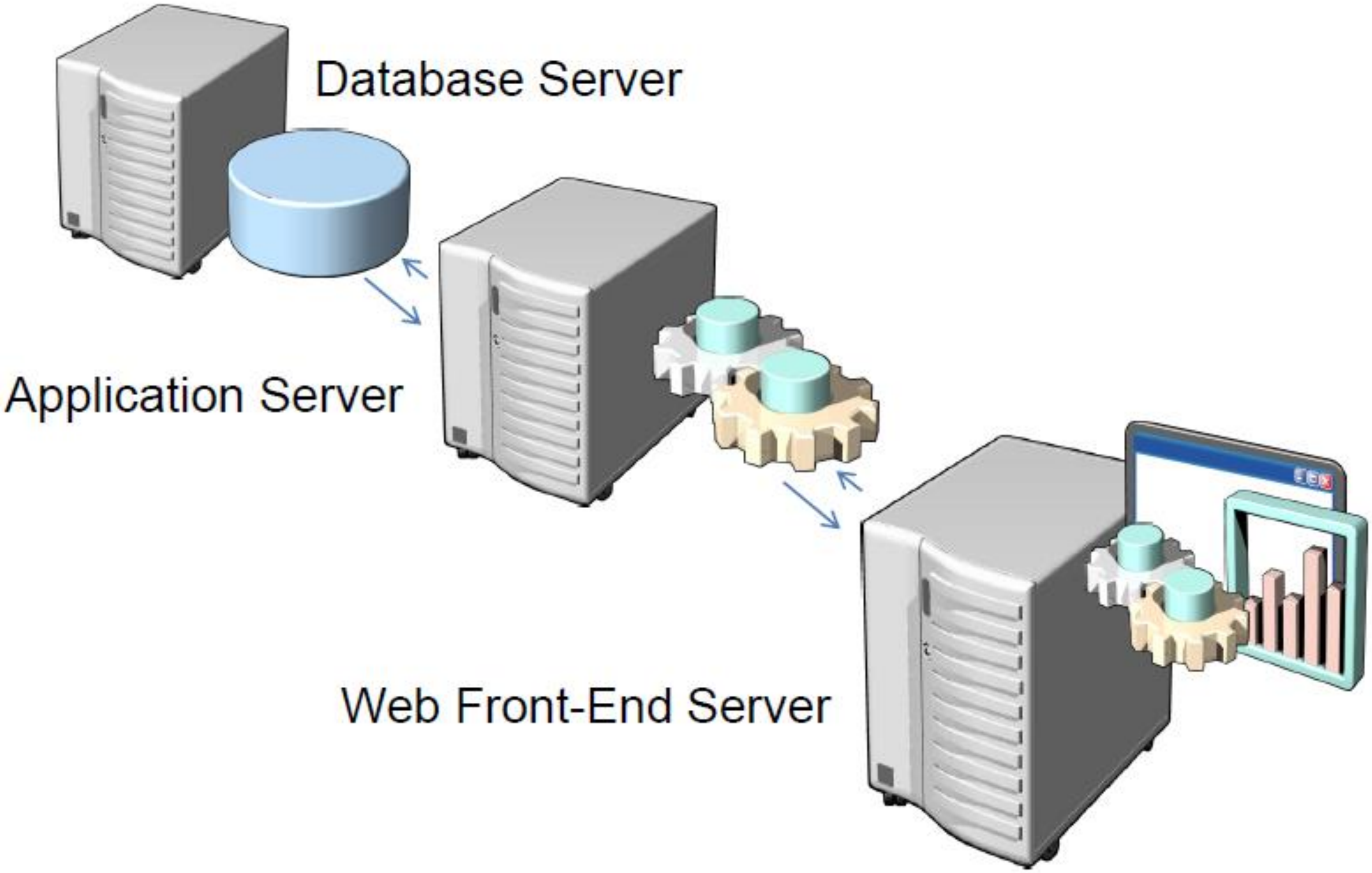
What’s covered here?

- How does database fit in the overall application infrastructure?
- Stages of database development lifecycle
- Software tools to facilitate database development
- Industry best practices

Importance of Database



Database Design Process

1. Identify and record database requirements
2. Create a conceptual model
3. Transform the conceptual model into a logical model
4. Implement a physical model from the logical model
5. Refine the physical model
6. Build a prototype and test the database design

Database Planning – Mission Statement

- *Mission statement* for the database project defines major goals of database application.

Example:

Database will contain information on employees and benefit plan enrollment. It will be used by HR staff only. It will not duplicate information already contained in the payroll information database.

Database Planning – Mission Objectives

- Once mission statement is defined, *mission objectives* are defined.

- Each objective should identify a particular task that the database must support.

Gather Information

- Examine existing data
- Interview potential users and management

Database Design

- Three phases of database design:
  - Conceptual database design
  - Logical database design
  - Physical database design

Database Design

- Main approaches include:
  - Top-down
    1. Identify high-level entities
    2. Gather required attributes and place them in entities
    3. Fine tune
  - Bottom-up
    1. Gather required attributes
    2. Group attributes into entities
    3. Fine tune

Application Design

- Design of application that uses and processes the database

- Database design and application design are parallel activities

CASE Tools

- Features provided by CASE tools include:
  - Data dictionary
  - Support data analysis
  - Develop conceptual, logical, and physical models

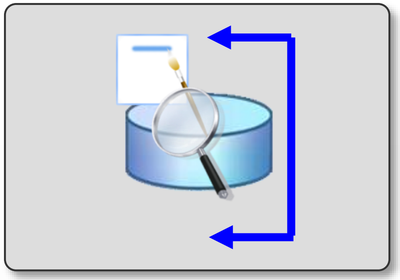
CASE Tools

- **Provide following benefits:**
  - Standardization
  - Integration
  - Consistency
  - Automation

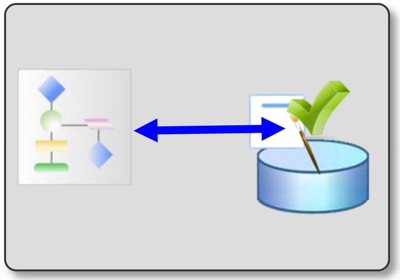
CASE Tools

- Forward Engineering
  - Generate code to implement database based on design
- Reverse Engineering
  - Read an existing database and create ERD

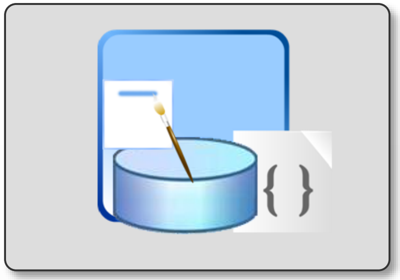
Best Practices for Database Design



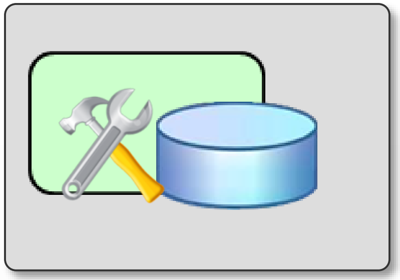
Ensure a clear definition of the database portion



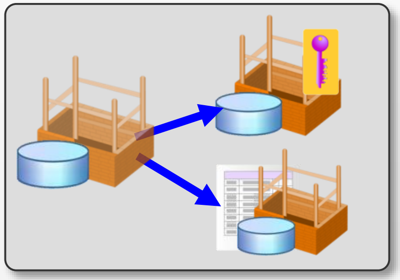
Validate database design goals against project scope



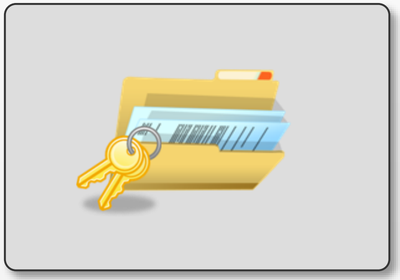
Choose a database design methodology



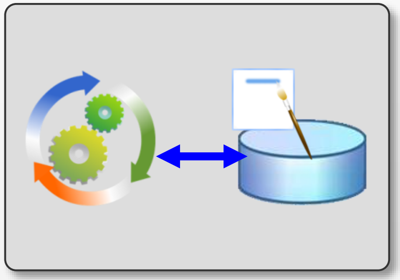
Choose a professional data-modeling tool



Begin with a conceptual model



Use a source control system



Retain application features of the existing database in the new design

Compare business needs against the ideal design and quality

Considerations for Modifying an Existing Database

☑ Identify the database requirements related to the current project

☑ Review and validate existing database documentation

☑ Reverse engineer the existing database design, if required

☑ Plan for migrating the data to the new design

☑ Develop a deployment strategy