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APPLIED DATABASE MANAGEMENT SYSTEM
BCSC0014

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OUTLINE

- Database users
- DDLC
- Case studies

DATABASE USERS

Users may be divided into

- Those who actually use and control the database content, and those who design, develop and maintain database applications (called “Actors on the Scene”), and

- Those who design and develop the DBMS software and related tools, and the computer systems operators (called “Workers Behind the Scene”).

DATABASE USERS

Actors on the scene

- **Database administrators:**
  - Responsible for authorizing access to the database, for coordinating and monitoring its use, acquiring software and hardware resources, controlling its use and monitoring efficiency of operations.

- **Database Designers:**
  - Responsible to define the content, the structure, the constraints, and functions or transactions against the database. They must communicate with the end-users and understand their needs.

CATEGORIES OF END-USERS

Actors on the scene (continued)

- **End-users:** They use the data for queries, reports and some of them update the database content.
- **End-users can be categorized into:**
  - **Casual**: access database occasionally when needed
  - **Naïve** or Parametric: they make up a large section of the end-user population.
    - They use previously well-defined functions in the form of "canned transactions" against the database.
    - Examples are bank-tellers or reservation clerks who do this activity for an entire shift of operations.

CATEGORIES OF END-USERS (CONTINUED)

- **Sophisticated:**
  - These include business analysts, scientists, engineers, others thoroughly familiar with the system capabilities.
  - Many use tools in the form of software packages that work closely with the stored database.
- **Stand-alone:**
  - Mostly maintain personal databases using ready-to-use packaged applications.
  - An example is a tax program user that creates its own internal database.
  - Another example is a user that maintains an address book

ACTORS ON THE SCENE

System Analysts/Application Programmers:

System analysts determine the requirements of end user, especially naïve and parametric end user, and develop specification for canned transaction that meet these requirement.

Application programmers implement these specification as programs.

WORKERS BEHIND THE SCENE

DBMS system designers and implementers are persons who design and implement the DBMS modules and interfaces as a software package.

Tool developers include persons who design and implement tools- the software packages that facilitate database system design and use and that help to improve performance.

Operators and maintenance personnel are the system administration personnel who are responsible for the actual running and maintenance of the hardware and software environment for the database system.

THE INFORMATION SYSTEM LIFE CYCLE

- In a large organization, the database system is typically part of an information system (IS), which includes all resources that are involved in the collection, management, use, and dissemination of the information resources of the organization.

- In a computerized environment, these resources include the data itself, the DBMS software, the computer system hardware and storage media, the personnel who use and manage the data (DBA, end users, and so on), the application programs (software)that accesses and updates the data, and the application programmers who develop these applications.

THE INFORMATION SYSTEM LIFE CYCLE

- The information system life cycle has been called the **macro life cycle,**

- whereas the database system life cycle has been referred to as the **micro life cycle.**

MACRO LIFE CYCLE

- Feasibility Analysis
  - Analyzing potential application areas
  - Identifying the economics of information gathering and dissemination
  - Performing cost benefit studies
  - Setting up priorities among applications
- Requirement Collection and Analysis
  - Detailed Requirements Collection
  - Interaction with Users
- Design
  - Design of Database System
  - Design of programs that use and process the database

MACRO LIFE CYCLE

- Implementation
  - Information system is implemented
  - Database is loaded & its transactions are implemented and tested
- Validation and Acceptance Testing
  - Testing against user's requirements
  - Testing against performance criteria
- Deployment, Operation and Maintenance
  - Data conversion
  - Training
  - System maintenance
  - Performance monitoring
  - Database tuning

THE DATABASE APPLICATION SYSTEM LIFE CYCLE

Activities related to the micro life cycle, which focuses on the database application system, include the following:

1. System definition. The scope of the database system, its users, and its applications are defined. The interfaces for various categories of users, the response time constraints, and storage and processing needs are identified.

2. Database design. A complete logical and physical design of the database system on the chosen DBMS is prepared.

3. Database implementation. This comprises the process of specifying the conceptual, external, and internal database definitions, creating the (empty) database files, and implementing the software applications.

THE DATABASE APPLICATION SYSTEM LIFE CYCLE

4. Loading or data conversion. The database is populated either by loading the data directly or by converting existing files into the database system format.

5. Application conversion. Any software applications from a previous system are converted to the new system.

6. Testing and validation. The new system is tested and validated. Testing and validation of application programs can be a very involved process, and the techniques that are employed are usually covered in software engineering courses.

7. Operation. The database system and its applications are put into operation. Usually, the old and the new systems are operated in parallel for a period of time.

8. Monitoring and maintenance. During the operational phase, the system is constantly monitored and maintained. Growth and expansion can occur in both data content and software applications.

*Activities 2, 3, and 4 are part of the design and implementation phases of the larger information system macro life cycle.

PHASES OF DATABASE DESIGN AND IMPLEMENTATION FOR LARGE DATABASES

Design the logical and physical structure of one or more databases to accommodate the information needs of the users in an organization for a defined set of applications.

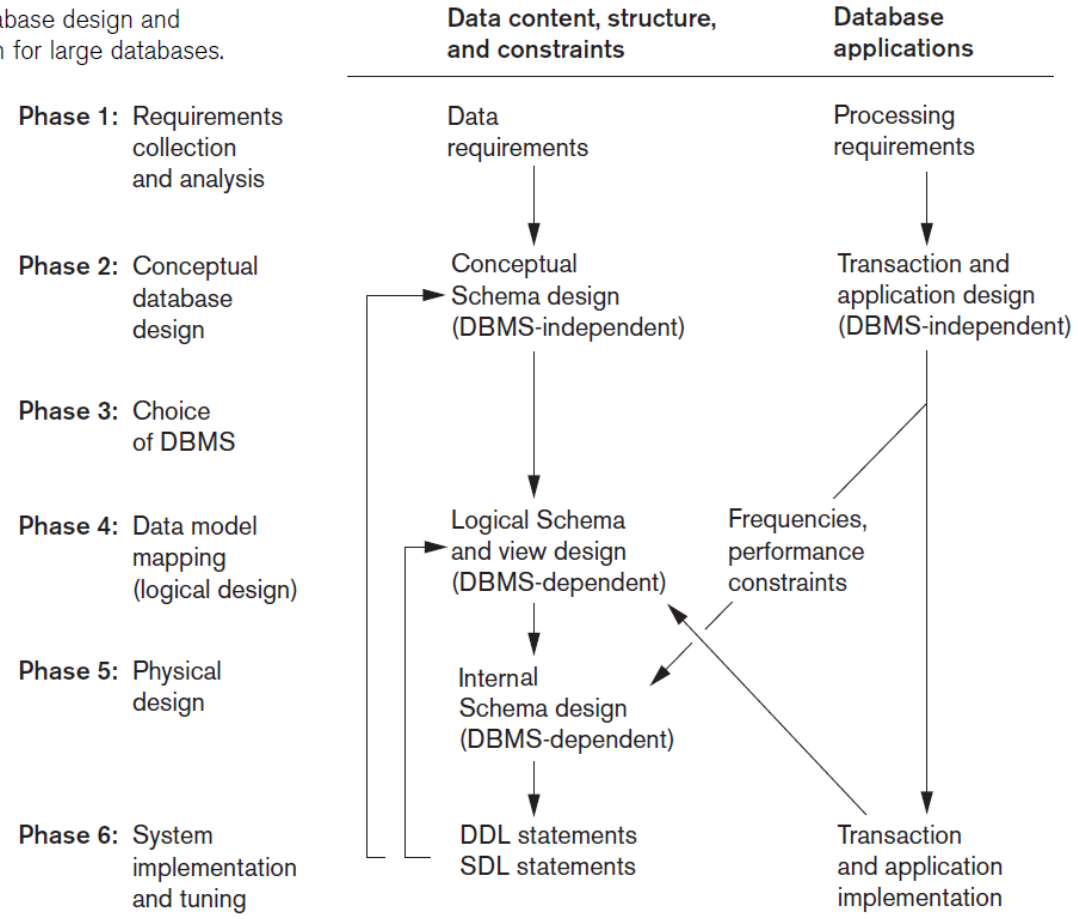
The goals of database design are multiple:

- Satisfy the information content requirements of the specified users and applications.
- Provide a natural and easy-to-understand structuring of the information.
- Support processing requirements and any performance objectives, such as

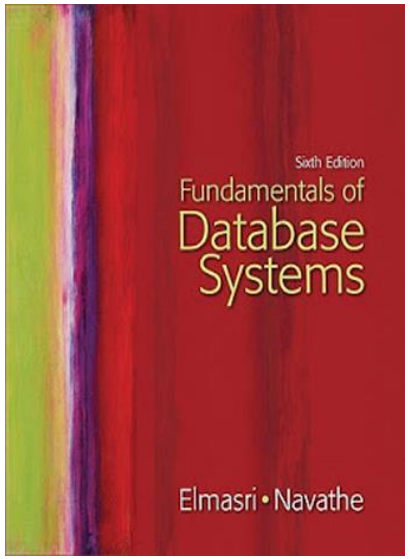
response time, processing time, and storage space.

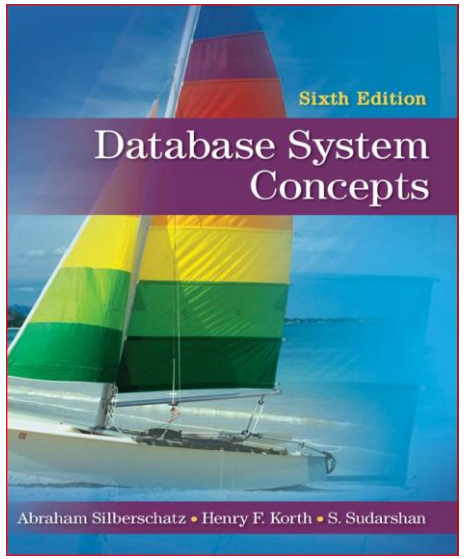
PHASES OF DATABASE DESIGN AND IMPLEMENTATION FOR LARGE DATABASES

Figure 10.1
Phases of database design and implementation for large databases.



REFERENCE BOOKS






Keep Learning
Keep Growing