1.3 Users of Database Systems

IT2306 – Database Systems I

Level I - Semester 2

Detailed Syllabus

1. Users and practitioners of a Database

2. Data administrator

   Database Administrator (DBA)

   Functions of a DBA

3. Roles of a DBA
   - Database Integrity
   - Transaction Processing
   - Concurrency Control
   - Database Security
   - Database Recovery

Database Users

Actors on the Scene

- Use and control database content, design, develop and maintain the database applications.
    - Database Administrator
    - Database Designers
    - Software Engineers
    - End-Users

Workers behind the scene

- Those who design and develop the DBMS SW and related tools.

Actors on the Scene

Database administrator (DBA) responsible for:

- Administering the DBMS and related SW
- Authorizing access to the database
- Coordinating and monitoring its use
- Acquiring software and hardware resources
- Tuning the DBMS for best performance

Database designer responsible for:

- Identifying the data to be stored
- Choosing appropriate structures to represent and store this data
- Communicate with end users and understand their needs

Actors on the Scene Cont.

End-Users

- People who require the access to the DB for querying, updating and generating reports.

- Types of End-Users

    Naive or parametric end users

    > canned queries and updates

    Casual end users

    > occasional, special-purpose access

    Sophisticated end users

    > deep knowledge of database design and DBMS facilities

    Standalone users

    > users of personal databases

Actors on the Scene Cont.

System analysts

- Determine requirements of end users

Application programmers

- Implement complex specifications (business logic) as programs

Data Administrator and Database Administrator

Both are responsible for managing database for an organization.

Data Administrator (DA) :

- Person in the organization who controls the data of the database.

- Determines what data to be stored in database based on requirement of the organization.

- Establish policies to maintain data.

- Works on such as requirements gathering, analysis, and design phases.

- Does not to be a technical person, any kind of knowledge about database technology can be more beneficial.

- A senior level person in the organization. in short, DA is a business focused person but should understand about the database technology.

Data Administrator and Database Administrator

Database Administrator (DBA) :

- Implement DA's decisions in the Database.

- Provides necessary technical support for implementing a database.

- Works on such as design, development , testing, and operational phases.

- A technical person having knowledge of database technology.

- Does not need to be a business person. in short, DBA is a technically focused person but should understand about the business to administrator the database effectively.

Roles of a DBA

- Design of the Conceptual and Physical Schemas
  - DBA must design the conceptual schema (decide what relations to store) and the physical schema (decide how to store them).
- Database Integrity
  - Introduce constraints for data.
  - Integrate business rules to the DB.
- Transaction Processing
  - Introducing isolation level and manage concurrent transactions to avoid inconsistent data.
- Concurrency Control
  - Introducing concurrency control techniques.
- Database Security
  - Responsible for ensuring that unauthorized data access is not permitted.
  - Create user accounts and specify account restrictions.

- Database Availability and Recovery.
  - Must take steps to ensure that if the system fails, users can continue to access as much of the uncorrupted data as possible.
  - The DBA must also work to restore the data to a consistent state .
  - Ensures that the database remains in a consistent state in the presence of failure.
  - Responsible for implementing procedures to back up the data periodically and maintain logs of system activity (to facilitate recovery from a crash)
  - Introduce checkpoints and recovery mechanism in Databases.

- Database Tuning
  - Users' needs are likely to evolve with time. Therefore responsible for modifying the database, in particular the conceptual and physical schemas, to ensure adequate performance as requirements change.

Workers Behind the Scene

DBMS system designers and implementers

- Design and implement the DBMS modules and interfaces as a software package

Tool developers

- Design and implement tools

Operators and maintenance personnel

- Responsible for running and maintenance of hardware and software environment for database system