

# **DATABASE MANAGEMENT ISSUES IN MOBILE COMPUTING**

## **Lesson 02**

### **Mobile Device Database Management**

# DATABASE

- A collection of systematically stored records or information
- Organized collection of data where the records are saved according to a specific model
- Not just arbitrarily stored data without any logic, each database stores data in a particular logical manner.

# QUERY

- Query searches data from database
- A query raises to the database during computing
- The required information, such as a 'select mobile number for a contact' is retrieved using a query

# TRANSACTIONS

- Computational actions, such as connecting (linking) to a database
- Using the database for querying for a record, deleting a specific set of records
- Modifying records, inserting into the records, and appending of the records

# TRANSACTIONS

- Transactions can be carried out with database records
- Transactions can be done that modify the database records
- Transaction can be to extract information stored in it to modify a select mobile number record

# TRANSACTIONS

- Considered as an act of business (transactions) between the application and the database.

# TRANSACTION COMMAND

- A command which is sent for retrieving the data from the database
- Embodies the logic used for obtaining (and storing) the data

# DATA STORED IN DATABASES

- Follows a logic
- Business logic indicates the logical way in which transactions (business) carried out
- Between two ends, for example, between database-client (application) and database-server or between an API and a database



# TABLE MODEL DATABASE

- Can be considered as permanent data stored in the system tables
- Seven types of tables (files) in a database
- Master, transaction, table, temporary, log, mirror, and archive

# RELATIONAL DATABASES

- Defined as a database structured in accordance with the relational model
- The relational model of data organization helps the database designer to create a consistent and logical representation of information

# THE RELATIONAL MODEL

- Follows a relational logic which means that it is assumed that all data can be represented as  $n$ -ary (binary means  $n = 2$ , tertiary means  $n = 3, \dots$ ) relations
- An  $n$ -ary relation is a subset of the Cartesian products of  $n$ -sets

# RELATIONAL DATABASE

- Entails that it is always possible to mathematically model the relations between the data records and get the answers to the relational equations for the queries
- The answers are as in two-valued predicate logic

# TWO-VALUED PREDICATE LOGIC

- Means that there are only two possible results on evaluation, for each proposition, either true or *false* and no third result, for example, 'null' or 'unknown', is possible

# DATABASE MANAGEMENT SYSTEM (DBMS)

- Provides a way to manage and access large amounts of data
- A DBMS for a mobile device provides for two components—database engine and synchronizer

# DBMS FUNCTIONS

- Facilitates insertions, modifications, and retrieval of local database and synchronizes the changes at the remote central server, enterprise, or cloud server
- DBMS software package
- An integrated set of functions, which are used to create databases

# DBMS FUNCTIONS

- Functions create a collection of files and data records known as a database
- DBMS functions are also used to maintain the database.
- Control access to data while maintaining integrity and enable taking backup of the data



# DBMS

- DBMS functions are provided to enable the application to use the data collected in the database
- An application can easily use those DBMS functions, which are permitted by the administrator

# DBMS FUNCTIONS

- Retrieve information from the database in a structured way
- Use a query language
- Present the information logically from the database

# RELATIONAL DBMS (RDBMS)

- Based on relational algebra and calculus
- Structured query language (SQL) used to access, insert, query, delete, and update data in an RDBMS
- Management also means establishing connection to a database and controlling data access, creation, and various changes in the schema.

# ORACLE RDBMS

- Oracle 9i Lite relational database for mobile computing applications
- Supports database access by using relational queries on the mobile client
- Includes support for Java, Visual Basic, and C++

# SQL

- SQL Anywhere Server is an RDBMS
- Scaled high or low at the server or at the mobile device
- Used in mobile applications
- Requires no administration

# SUMMARY

- Database— a collection of systematically stored records or information
- Seven Tables in Table Model Database
- Relational Database
- Two-valued predicate logic
- DBMS
- RDBMS
- SQL

## End of Lesson 02

# Mobile Device Database Management