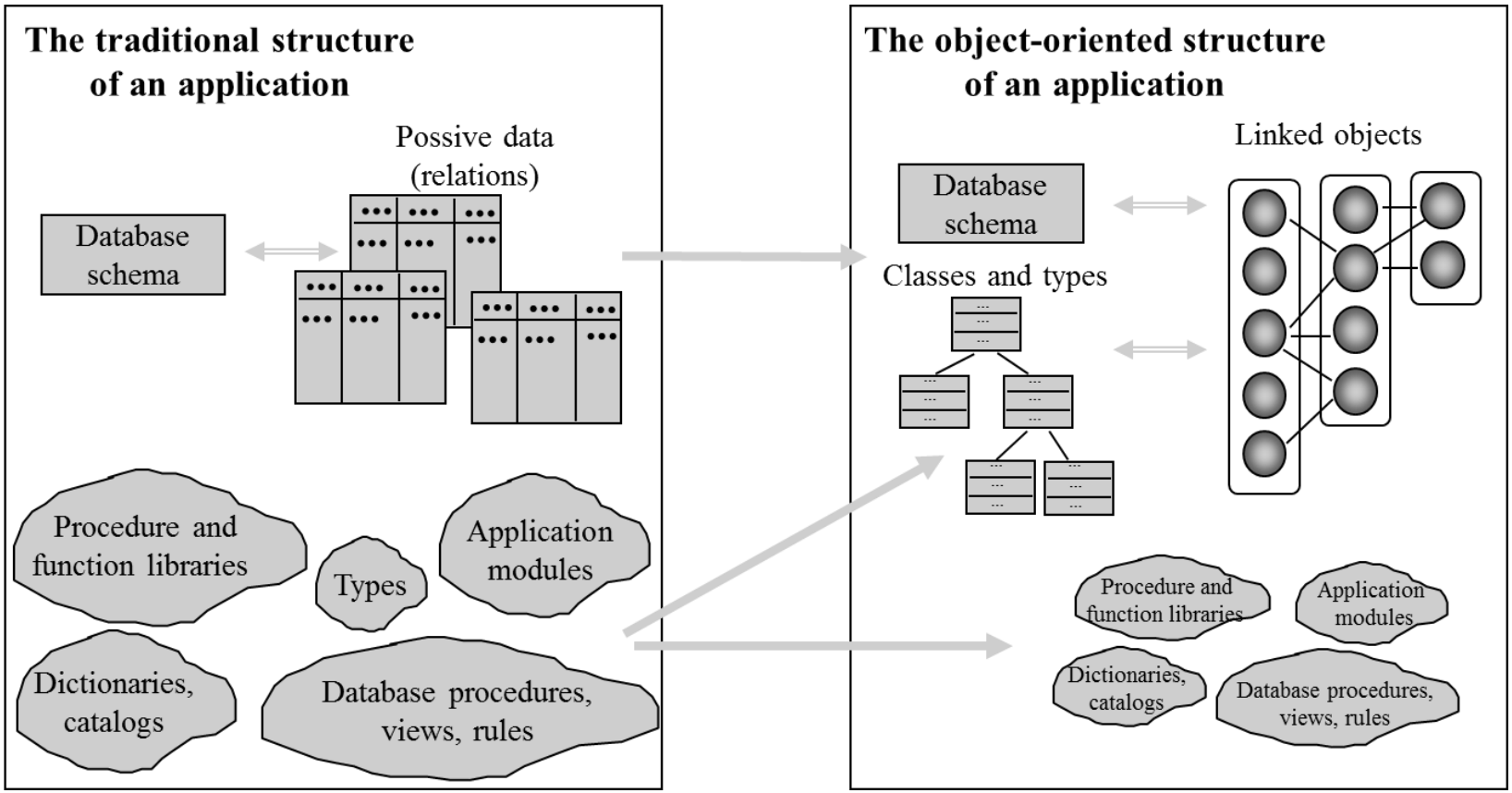
Fakultas Informatika
School of Computing
Telkom University

CII3B4
Pemrograman Berorientasi Objek

JDBC

Traditional vs object-oriented application



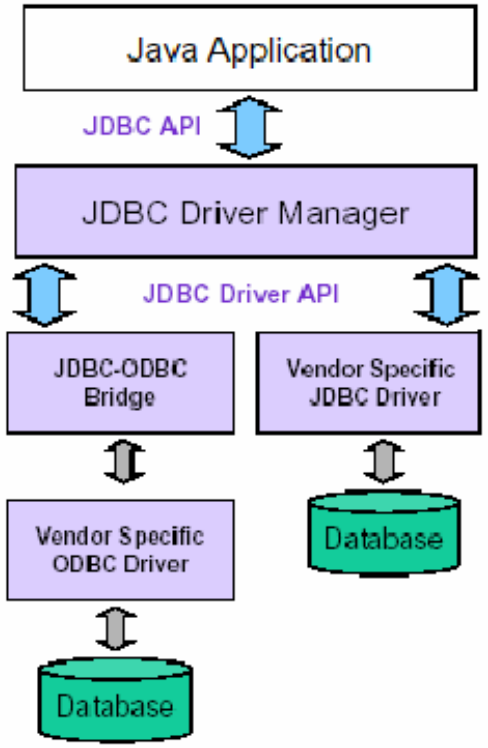
RDBMS vs OODBMS

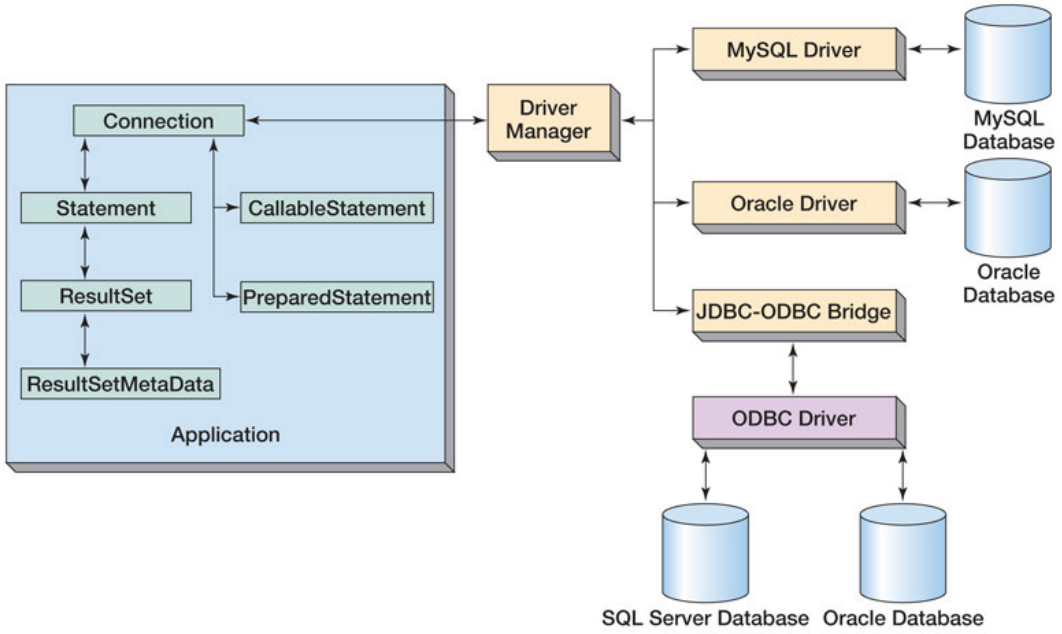
- Relational databases store data in tables that are two dimensional.
  - The tables have rows and columns.
- Relational database tables are "normalized"
  - data is not repeated more often than necessary.
- All table columns depend on a primary key (a unique value in the column) to identify the column.
  - Once the specific column is identified, data from one or more rows associated with that column may be obtained or changed.

Java Database Connectivity

- An API that lets you access virtually any tabular data source from the Java programming language
- an interface which allows Java code to execute SQL statements inside relational databases
  - the databases must follow the ANSI SQL-2 standard

General Architecture





Database Programming Steps

- Establish a connection
- Begin transaction
- Create a statement object
- Associate SQL with the statement object
- Provide values for statement parameters
- Execute the statement object
- Process the results
- End transaction
- Release resources

Using JDBC

- Load the driver:
  - The driver class libraries need to be in the CLASSPATH for the Java compiler and for the Java virtual machine.
  - The most reliable way to load the driver into the program is:
    - Class.forName(string).newInstance();

Using JDBC

- Establish a connection to the database:
  - A connection URL string includes the literal jdbc:, followed by the name of the driver and a URL to the database
    - String url =
    - "jdbc:oracle:thin:@reddwarf.cs.rit.edu:1521:csodb";
  - Create a Connection object:
    - Connection con = DriverManager.getConnection(url, dbUser, dbPassword

Using JDBC

- Begin the transaction
  - con.setTransactionIsolation(connection.TRANSACTION_SERIALIZABLE);
  - con.setAutoCommit(false);
- Create a statement object
  - Statement stmt = conn.createStatement();
- Associate SQL with the statement object
  - String queryString = "create table students " + "(name varchar(30), id int, phone char(9))";

Using JDBC

- Process the statement:
  - Example statements:
    - `ResultSet rs = stmt.executeQuery(querystring);`
    - `int result = stmt.executeUpdate(updatestring);`
    - `ResultSetMetaData rsMeta = rs.getMetaData();`
  - Compiled queries can be processed via a PreparedStatement object
  - Stored procedures can be processed via a CallableStatement object

Using JDBC

- End transaction
  - con.commit();
  - con.rollback();
- Release resources
  - con.close();

Hibernate ORM

- an object-relational mapping framework for the Java language, providing a framework for mapping an object-oriented domain model to a traditional relational database.
- Hibernate solves object-relational impedance mismatch problems by replacing direct persistence-related database accesses with high-level object handling functions.

Question?

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THANK YOU