

GLOSSARY OF DATABASE DOMAIN

Relational database: A relational database is a collection of data items organized as a set of formally-described tables from which data can be accessed or reassembled in many different ways without having to reorganize the database tables. [1]

NoSQL database: NoSQL database, also called Not Only SQL, is an approach to data management and database design that's useful for very large sets of distributed data. This technology seeks to solve the scalability and big data performance issues that relational databases weren't designed to address. NoSQL is especially useful when an enterprise needs to access and analyse massive amounts of unstructured data or data that's stored remotely on multiple virtual servers in the cloud [2].

Table: A table organizes the information about a single topic into rows and columns. Each single piece of data is a field in the table. A column consists of all the entries in a single field. Fields, in turn, are organized as records, which are complete sets of information, each of which comprises a row. [3]

Field: A field is a data structure for a single piece of data. Fields are organized into records, which contain all the information within the table relevant to a specific entity. For example, in a table called customer contact information, telephone number would likely be a field in a row that would also contain other fields such as street address and city. The records make up the table rows and the fields make up the columns [4].

Column: In a database, a column consists of all the entries in a single field. For example, in a table called customer contact information, telephone number would likely be a field in a row, and a column contains the telephone numbers of all the customers [3].

Row: In a database, a row (sometimes called a record) is the set of fields within a table that are relevant to a specific entity. For example, in a table called customer contact information, a row would likely contain fields such as: ID number, name, street address, city, telephone number and so on [5].

Integrity rules: Relational tables follow certain integrity rules to ensure that the data they contain stay accurate and are always accessible. An example of it is that the rows in a relational table should all be distinct. If there are duplicate rows, there can be problems resolving which of two possible selections is the correct one [6].

Primary key: When each row in a table is different, it is possible to use one or more columns to identify a particular row. This unique column or group of columns is called a primary key. Any column that is part of a primary key cannot be null; if it were, the primary key containing it would no longer be a complete identifier [6].

Foreign key: There must be one column that appears in both tables in order to relate them to each other. This column, which must be the primary key in one table, is called the foreign key in the other table. A foreign key must either be null or equal to an existing primary key value of the table to which it refers. This is different from a primary key, which may not be null [6].

UML: Unified Modelling Language (UML) is a standard notation for the modelling of real-world objects as a first step in developing an object-oriented design methodology. Among the

concepts of modelling that UML specifies how to describe are: class (of objects), object, association, responsibility, activity, interface, use case, package, sequence, collaboration, and state [7].

Query: A query is a request for data or information from a database table or combination of tables. One of several different query languages (e.g. SQL) may be used to perform a range of simple to complex database queries [8].

SQL: SQL (Structured Query Language) is a standardized programming language used for managing relational databases and performing various operations on the data in them. Initially created in the 1970s, SQL is regularly used by database administrators, as well as by developers writing data integration scripts and data analysts looking to set up and run analytical queries [9].

Database Schema: A database schema is the skeleton structure that represents the logical view of the entire database. It defines how the data is organized and how the relations among them are associated. It formulates all the constraints that are to be applied on the data. It contains a descriptive detail of the database, which can be depicted by means of schema diagrams [10].

Data abstraction levels: Database systems are made-up of complex data structures. To ease the user interaction with database, the developers hide internal irrelevant details from users. This process of hiding irrelevant details from user is called data abstraction and is divided in three levels: external, logical and physical [11].

External level: This is the data abstraction level where users see the data in the form of rows and columns. This level illustrates the users how the data is stored in terms of tables and relations. This is the highest level in data abstraction. The users will have different views here, based on their levels of access rights [11].

Logical level: This is the data abstraction level which describes the actual data stored in the database in the form of tables and relates them by means of mapping. This level will not have any information on what a user views at external level. This level will have all the data in the database. Any changes done in this level will not affect the external or physical levels of data [11].

Physical level: This data abstraction level describes how the data is actually stored in the physical memory like magnetic tapes, hard disks etc. This is the lowest level in data abstraction. At this level, developer would know the requirement, size and accessing frequency of the records clearly [11].

Database administrator: It is the person responsible for managing databases. Each database administrator may be engaged in performing various database manipulation tasks such as archiving, testing, running, security control, etc., all related to the environmental side of the databases [12].

Database Management System: A database management system (DBMS) is system software for creating and managing databases. The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage data [13].

Database server: Database server is the term used to refer to the back-end system of a database application using client/server architecture. It performs tasks such as data analysis, storage, data manipulation, archiving, and other non-user specific tasks [14].

References:

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