

AIT 524: Weekly Assignment 01

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Author Note

This task is being submitted as an assignment task for the course 'Database Management Essential' offered in Spring 2018. I tried to follow APA style for submitting. But I omitted some portion as like abstract, keyword as it seems redundant for the part of weekly assignment. For any kind of inquiry, feel free to contact at **tchowdh6@masonlive.gmu.edu**.

Relational Database

An organized set of raw facts or data which can satisfy the questionnaires related to a real things or abstract concept is called information. This information can be encoded and encrypted in different manners which also reduces the uncertainty of events. Data can be the bridge for different dimensions. This creates dimensional data from different perspectives. For example, the sale in Walmart can vary based on time, products and location of the stores. The entity (Sale's data) and relationships (link between time, product and location) attributed to a physical data model. This data can be stored in tabular way as like spread sheet. Collected data organized in a set of tables abide by pre-defined rules and can be accessible in many ways without affecting the table is called relational database.

Role of Relational Database in Organization

Management of data is very crucial for any organization. The key roles of relational database include accessing data, maintaining relationships, newer and better updates. Storing data is not the one and only problem. The problem arises during manipulation the data. The relational database helps to solve the issue of size, updating, accuracy, security, redundancy also.

Characteristics of Relational Database

The relational database possesses some characteristics. This can be listed as like follows:

- Data is fitted into predefined categories in columns. The data is presented in tabular manner.
- Data content has some properties as like table name, column name, primary key value of row. By specifying the properties data can be accessible.
- Supports the CRUD (Create, Read, Update, Delete) operation

- Supports data manipulation, transaction management, physical and logical data independence. Moreover, a language for doing these works.

Main functions of the Relational Database Management System (RDBMS)

From our previous discussion we have got an idea about relational database's importance and characteristics in an organization. The functions of database management are mainly in five sectors. They are Concurrency, Security, Backup and Recovery, Integrity and Data Description. As multiple users use the database so RDMS helps in concurrent access. The issue is always related to the users. So, the security rules is strictly maintained by the management system. Moreover, if a problem occurs then for recovering data RDBMS also ensures to backup the data on a regular basis. As database is manipulated by different users so maintain the integrity is also import as well as security. So, the data structure and rules are always oriented to maintain the integrity of data.

Importance of Database Design

Storing and manipulating data in an efficient and effective way mainly depends on design of database. Scale of the database is an important factor. From time to time, the database will grow in different dimension. So, it is crucial fact that a database design should be followed from the very beginning. Moreover, secure database design, a good backup policy are also mandatory task for database design. Most importantly providing a perfect service to the organizations' employees so that they can easily manipulate the data can be ensured by a good design of database.

Types of Databases

Though there are tons of databases in this current world, but we can make an overall classification on those databases. Basically, there can be three categories for databases. First

comes Relational Database, then NoSQL and very recently NewSQL Databases. Some examples from these three sections are as follows:

Relational Database: Oracle, MySQL, Posgres.

NoSQL Database: MongoDB, Cassandra.

NewSQL Database: VoltDB, MemSQL.

Fundamental Difference between NoSQL and Relational Database

The main difference started from the data structure. Whether relational database maintain a nice data model and table format, in that sense NoSQL provides a higher level of flexibility in case of relation. That's why NoSQL can be coped easily with demand of elastic scalability for current huge data amount. But in case of reporting and standardization NoSQL still now leg behind. In a nutshell, NoSQL is a nice database system for this era of internet where billion of users are creating data in every second in different sectors. The fundamental difference lies in velocity, variety and volume of data handled by NoSQL compared with Relational Database.

Role of a Relational Database in the Big Data Ecosystem

The main problem of Bigdata is the structure. Though this is one of selling point of Bigdata. As bigdata does not live in isolation so, for effective use of Bigdata it is necessary to combine the results of Bigdata analytics with the existing data. In that case relational database plays the big role for processing the data for decision making.

Future of Relational Database

Based on my studies over this week, what I realized that the relational database has already been started to adapt. For example, if we see Postgres we see there are many NoSQL-like features has been added. NoSQL, though at the initial steps but it will never go away. But it has

lot of laggings in case of performance. So, in case of high productivity, flexibility, administrative ease Relational Database still now possess a lot of future.

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