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DBD181

Assignment 1

Freerk van den Bos
602074

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The importance of a database

Databases are used to store data; this can be on paper or computerized. Databases are an especially important part of any business. Businesses of all sorts has data to be stored like customer information, inventory, employee information, etc., databases provide a place to store all this information and provides security.

Databases allows the user to store data in a centralized environment meaning that all the data is stored in one place. This provides a lot of advantages over traditional filing systems[1].

Some advantages are:

- Beter data integrity[2]
- Beter security
- The user can control data access.
- Data consistency

Databases offers a structure that is used to store and organize data, this helps with data integrity and prevents from duplicates of the data being stored on the database. Data organizations help with efficient data management. (Bhardwaj, n.d.)

The owner of the database can control data access this provides a safeguard for the business as only authorized users can access sensitive information on the database, this does not only protect the business's sensitive information but also protects the customers of the business, e.g. a bank stores the card information of its customers and if that information is accessible by anyone the customer's card information can be used to steal and use the customer's money.

Databases can retrieve data very quickly; this helps the business with managing substantial amounts of information at remarkable speeds. Databases also keeps data consistent meaning that there are no duplications of the data stored, the data is accurate and complete, the data will also be the same across all databases used by the business. (Arnold, 2023)

Characteristics and Importance of data quality

The following are characteristics of data quality:

- Accuracy
- Completeness
- Accessibility
- Integrity
- Understandability

Data accuracy is important because if data is inaccurate, it will cause problems in the database, if the data is correct the business using the database can run more efficient. If there are inaccurate

[1] Traditional filing systems are data that is stored on paper in filing cabinets.
[2] Ensures that data is complete and correct.

data in the database an employee would have to go search for the inaccurate data and fix it this can take a lot of time. Inaccurate data also disrupts the decision-making process in a business environment because the inaccurate data leads to wrong conclusions being make with will affect every aspect of a business's strategies. (Anon., 2024)

It is important for data to be complete as this ensures that no essential information is missing in the database. Data completeness, just like data accuracy, ensures that there are no problems in the database with will cause the business's conclusions are incorrect and effecting their strategies. (Anon., 2023)

Data accessibility ensures that the end-user can access the database quickly and easily, this will help the business to quickly adapt their strategies accordingly. Data accessibility ensures a business can run more efficiently at n faster pace.

Data understandability is important because it helps the data scientist to easily understand the data and the database, this in turn makes it easier to predict different outcomes for a business. (Bryant, 2020)

Data integrity ensures that the data is the database meet the above-mentioned data quality characteristics. Data quality is important because it ensures that the business has a database that will help them function more effectively and that they can make good predictions to compete with their competitors.

Role and functions of a DBMS

A Database Management System (DBMS) is software that is used to store, retrieve, and run queries on data. The DBMS acts as an interface between the end-user and the database, this allows the end-user to create, update, delete and read data stored in the database. The DBMS manages the data and the schema of the database and allows the data to be manipulated or extracted by other programs or the end-user. ("DBMS Notes PDF – InstaPDF")

A DBMS ensures that the management of data is as effective as possible and without it the database will not run or manage data effectively is impossible as the end-user will not be able to access the database to read, write, update or delete data in the database.

A DBMS gives the end-user a view of all the data in the database and translates all the requests from all the applications that uses the database. A DBMS improved data security and create stronger relationships between data. A DBMS improves security by giving the company the ability to enforce data privacy e.g., restricted access to data in the database meaning only people with company log in credentials can access the database or only computer that is on the company network can access the database. A DBMS also allows data sets to relate to one another and manages relationships between data sets. (Media, 2018)

Different types of DBMS software

- Oracle: Is a DBMS with advanced data management tools, it supports data structures for example, semi structured data and structured data. Oracle is mostly used for large databases.
- MySQL: Is a DBMS that is mostly used for web-based applications, it free to use but versions that you must pay for do exist, companies use these versions. The free version is fast and very reliable, whereas the paid versions have more features and tools to manage the database.
- Microsoft SQL Server: This DBMS is used for cloud-based and local database servers, it can be designed to run either a cloud-based database server, a local database server or it can run both ate the same time. Microsoft SQL Server can easily collaborate with other Microsoft products thus it is recommended to large companies that works with other Microsoft products.
- MongoDB: This is a NoSQL[3] DBMS that is free to use, it supports structured and unstructured data. Unlike other databases MongoDB does not use a schema to store the data and stores the data is document format.
- MariaDB: Is a free to use DBMS but like MySQL also have paid-for versions available. MariaDB offers lots of plugins and provides SQL features. MariaDB is compatible with MySQL and is scalable and supports lots of varies storage engines[4].
  (Foote, 2023)

Structured Query Language (SQL)

Structured Query Language (SQL) was standardized by the American National Standard Institute, or ANSI and the International Organization for Standardization, or ISO. SQL allows the user to declare what they want without the need of writing a step-by-step procedure. (Forouzan, 2013)

SQL is a programming language that is used in relational databases. ("Structured Query Language (SQL) - TechTarget") Database developers use SQL to query the database. It is used on websites to store a process data that is used or entered on the website.

Queries in SQL is used to do the following:

- Create tables in the database (Figure 1)
- Read data in the tables.
- Update tables/data in the database (Figure 2)
- Delete tables/data in the database (Figure 3)

(Anon., 2023)

[3] Is a DBMS that is non-relational and does not use SQL.
[4]Storage engines manage the way data is stored in the database.

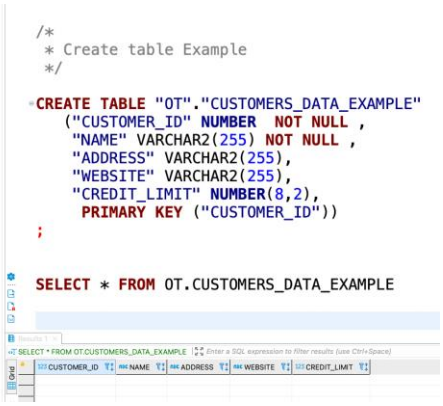

Figure 1:https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.nitendratech.com%2Fdatabase%2Fsql-create-table-statement%2F&psig=AOvVaw1eaC7XCrkVC9dQmzxAQQXs&ust=1721403629987000&source=images&cd=vfe&opi=89978449&ved=0CBQQjhxqFwoTCOjpzbP2slcDFQAAAAAdAAAAABAE

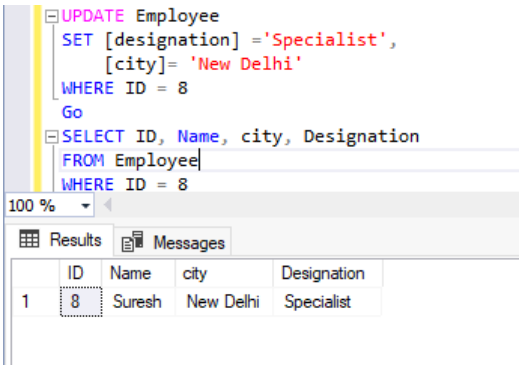

Figure 2: https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.sqlshack.com%2Fgetting-started-with-the-sql-update-syntax%2F&psig=AOvVaw3g4Uulom7wyUbpW_0Izqzk&ust=1721403833901000&source=images&cd=vfe&opi=89978449&ved=0CBEQjRxqFwoTCLDMo5X3slcDFQAAAAAdAAAAABAE

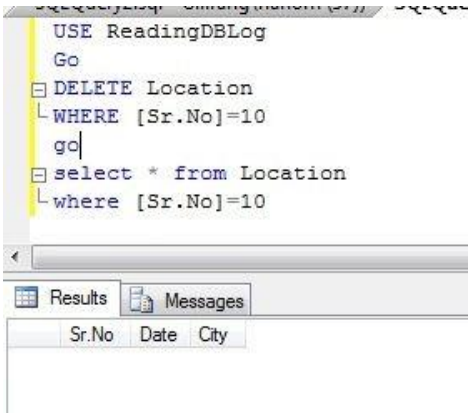

Figure3:https://www.google.com/url?sa=i&url=https%3A%2F%2Ffi.pinterest.com%2Fpin%2F196891814933054219%2F%3Famp_client_id%3DCLIENT_ID%2528_%2529%26mweb_unauth_id%3D%26amp_url%3Dhttps%253A%252F%252Ffi.pinterest.com%252Famp%252Fpin%252F196891814933054219%252F%26amp_expand%3Dtrue&psig=AOvVaw3tcoMWPlDOpkZp9X0ckGRo&ust=1721403965724000&source=images&cd=vfe&opi=89978449&ved=0CBEQjRxqFwoTCJi87tL3slcDFQAAAAAdAAAAABAT

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