# DATABASE MANAGEMENT SYSTEMS

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## What are Databases?

A Database is a shared, integrated computer structure that stores a collection of data.

## DATA /INFORMATION

Data is raw unprocessed facts.
Information is the result of processing raw data
There exist two types of Data:
Meta Data  and End user Data

## Data management and DBMS

Uses is a discipline used for the storage and retrieval of data.
DBMS – Database management systems
This is a collection of programs the manages the DB structure
Database is like a well organized file cabinet  in which DBMS help manage the cabinets

## Access/My research

Microsoft access is a DBMS That combines the relational Microsoft Jet DB Engine with a GUI and software development tool.
Access uses Data Modeling as well as SQL to create Personal DBMS'.
* I used Microsoft Access to create a user friendly database, which was for the use of a lawn care service. Access proved to very interesting and useful.

## DBMS Advantages

- Manages transactions between the end user and the database
- Facilitates
* Data access
* Data security and integrity
* Data sharing
* increases end user productivity
* needed for management of large systems of Data



Interaction between the End User and the Database

## Types of Databases

| Single User database | Multiuser database | Centralized Database | Distributed database | Cloud database |
|---|---|---|---|---|
| • Supports one user at a time | • Supports multiple users at a time | • Data is ocated at a single site | • Data is distributed across different sites | • Uses cloud data services |

## Database  challenges

- **Large numbers of people want access to data, This can cause a plethora of database problems. These include, Data security, Data privacy, backup and recovery, integrity.**
- **All of these can be comprised with the poor setup of a DBMS.**
- **Ex. When the same data is given access to multiple people to change at will, they could run into data anomalies, or redundancies.**
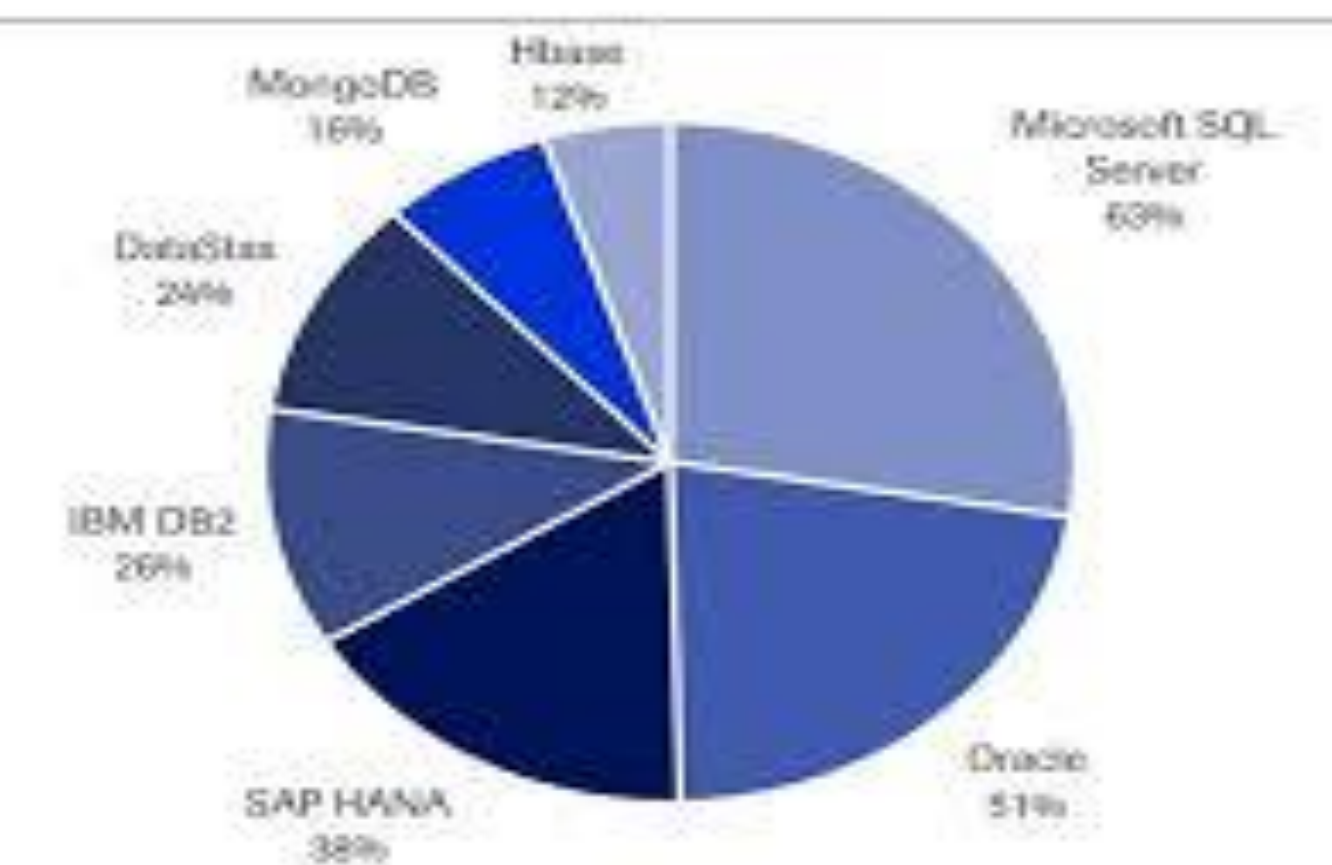
## Good design in a Database

Good design in a Database includes
• Encouraged data sharing
• Helps control data redundancy
• Helps Manage data accuracy/ integrity
• Supports concurrent/ distributed  access
• Permits storage of vast volumes of data with efficient access

## Top Databases for 2015



## NoSQL Vs. SQL

NoSQL Databases
 *  Not based on the relational model
 *  Support distributed database architectures
 *  Provide high scalability, high availability, and fault tolerance
 *  Support large amounts of sparse data
 *  Geared toward performance rather than transaction consistency

| **NoSQL** | | **SQL** |
|---|---|---|
| • **Has high scalability and fault tolerance** • **Low cost** • **Supports big data** | **VS.** | • No complex programming • There is relational support • There is data integrity |

## Data Modeling/SQL

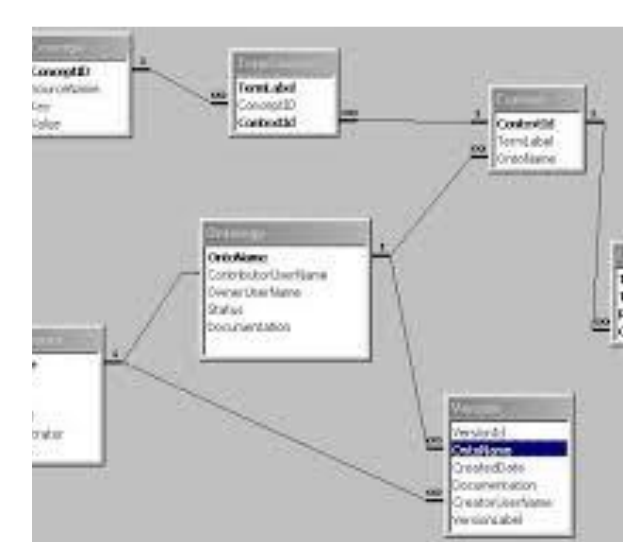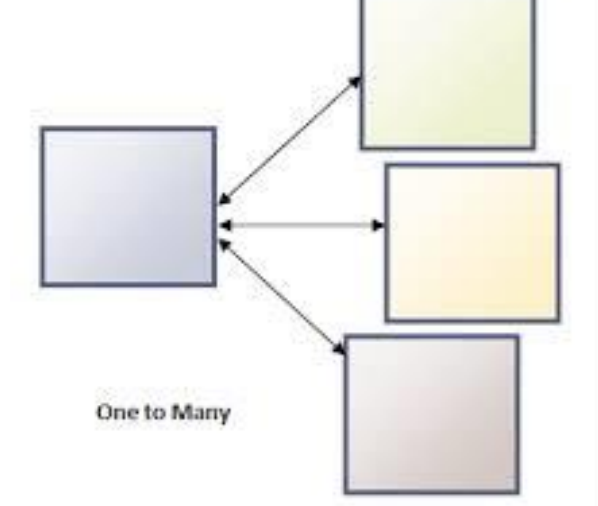| Entity/ Entity set | Attributes | Relational data/ Relationships | 1 – 1 Relationship | One _ To _ Many | May – to - Many |
|---|---|---|---|---|---|
|  |  |  | **1:1** |   One to Many | M×M |
| People, place, thing , or event  from, which the data will be collected. | Characteristics of an entity/ used with an entity set. | Describes the the association among entities  * 1- 1  *1-M  *M-M | • A single occurrence of one entity type can be associated with a single occurrence of the other entity type and vice versa. | • A single occurrence of one entity type can be associated with a single occurrence of the other entity type and vice versa. | "many" can be either an exact number or have a known maximum |