

# 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

- Supports one user at a time

### Multuser database

- Supports multiple users at a time

### Centralized Database

- Data is located at a single site

### Distributed database

- Data is distributed across different sites

### Cloud database

- 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.

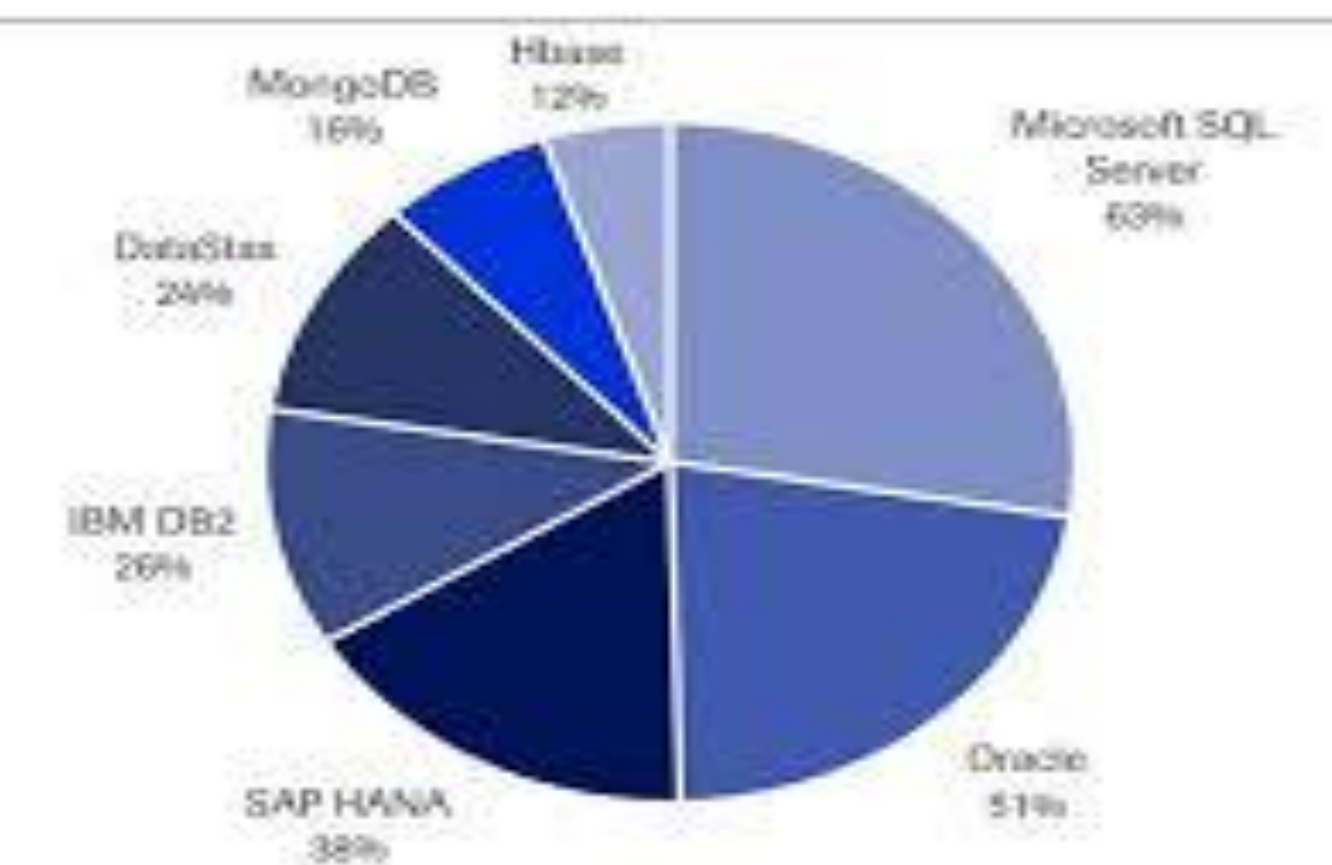
## Good design in a Database

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

Figure 16 When deploying new applications, which database alternatives do you evaluate?



Source: Gartner and Company Mid-Year 2015 IT Spending Survey, May 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

- Has high scalability and fault tolerance
- Low cost
- Supports big data

VS.

### SQL

- No complex programming
- There is relational support
- There is data integrity

## Data Modeling/SQL

### Entity/ Entity set



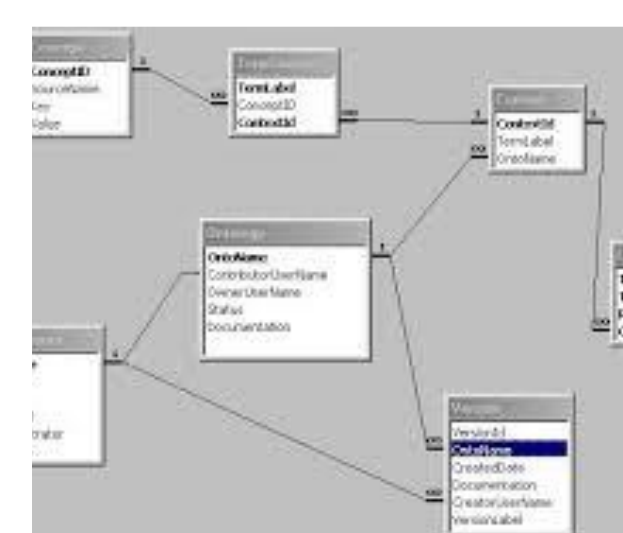
People, place, thing, or event from, which the data will be collected.

### Attributes



Characteristics of an entity/ used with an entity set.

### Relational data/ Relationships



Describes the the association among entities

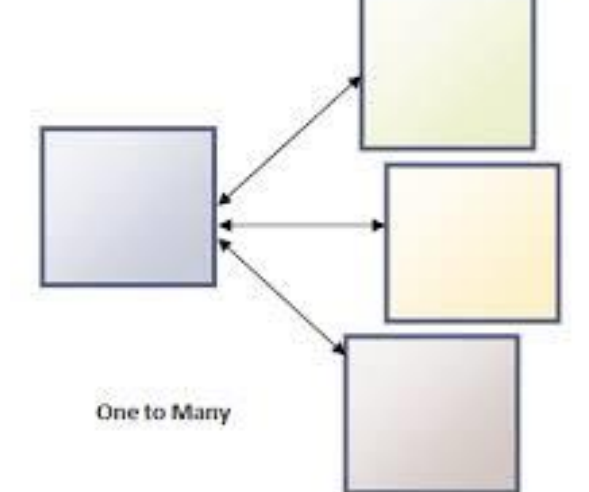
- \* 1- 1
- \* 1-M
- \* M-M

### 1 - 1 Relationship

# 1:1

- A single occurrence of one entity type can be associated with a single occurrence of the other entity type and vice versa.

### One \_ To \_ Many



- A single occurrence of one entity type can be associated with a single occurrence of the other entity type and vice versa.

### May - to - Many

# M x M

"many" can be either an exact number or have a known maximum