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

**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

**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**
- 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

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

**Data Modeling/SQL**

<table>
<thead>
<tr>
<th>Entity/Entity set</th>
<th>Attributes</th>
<th>Relational data/Relationships</th>
<th>1 – 1 Relationship</th>
<th>One To Many</th>
<th>May – to - Many</th>
</tr>
</thead>
<tbody>
<tr>
<td>People, place, thing, or event from which the data will be collected.</td>
<td>Characteristics of an entity/used with an entity set.</td>
<td>Describes the association among entities</td>
<td>A single occurrence of one entity type can be associated with a single occurrence of the other entity type and vice versa.</td>
<td>A single occurrence of one entity type can be associated with a single occurrence of the other entity type and vice versa.</td>
<td>“many” can be either an exact number or have a known maximum</td>
</tr>
</tbody>
</table>

**Interaction between the End User and the Database**