Entity Relationship Diagram

An entity-relationship Diagram is a graphical representation of an information system that shows the relationship between people, objects, places, concepts or events within the system.

An ERD is a data modeling technique that can help define business processes and can be used as the foundation for a Relational Database.

Entity Relationship Diagram

An Entity Relationship Diagram is also known as ERD, ED Diagram or ER Model. It is a structured diagram for the use of database design.

An ERD contains different symbols and connectors that visualize two important pieces of information:

1. The MAJOR entities within the system scope.
2. The inter-relationship among these entities.

Why use ERD's

There are several reason for using ERD's.

1. Database Design: Depending on the scale of any changes to a database we have to plan the changes carefully to avoid ruining the data in a production database.
2. Database debugging: When working with a large database we can obtain the full picture of the entire database schema. It allows us to locate entities, view their attributes and to identify the relationship they have with other.

Why use ERD's

There are several reason for using ERD's.

3. Database Creation and Patching: There are several tools that can automate the database creation and patching since the ERD is no longer just a static diagram but a mirror that reflects the physical database structure.
4. Aid in Requirement Gathering: We determine the requirements of an information system by drawing a conceptual ERD that depicts the high-level business objects of the system. It will assist in the evolution into the physical database.

ERD Terminology

Entity – Also called a table – A definable thing or concept within the system.

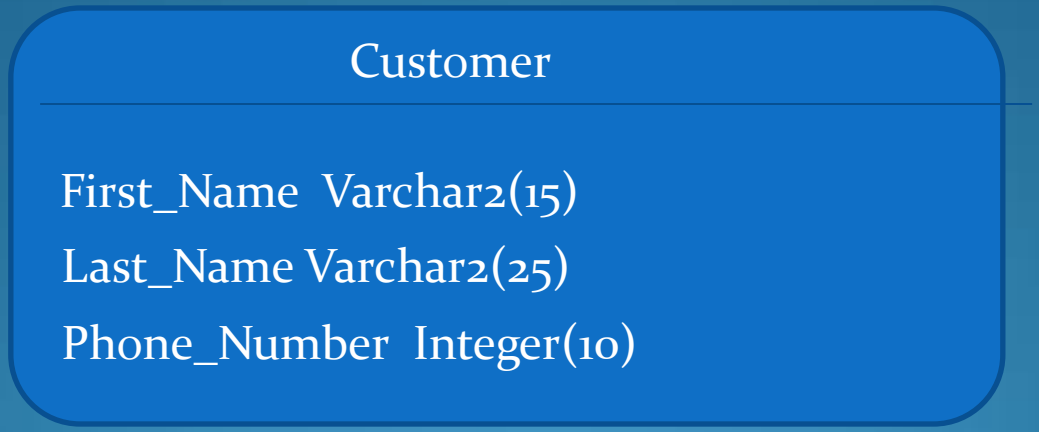
Attribute – Something that describes or qualifies an entity. Example for Employees: Number, Name and hire date.

Relationship – A named association between entities showing optionality and degree.

Cardinality – Defines the relationship between entities and attributes or entities of one table to entities of another table in terms of numbers.

ERD Symbols

Entity – also known as a column and shows its attributes.

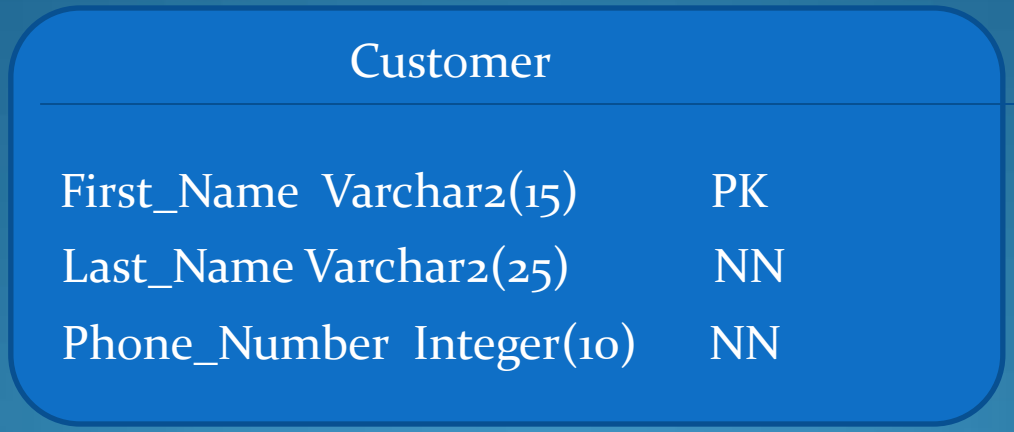


First_Name, Last_name and Phone_Number are Attributes of the Entity Customer.

We now have the Table Name, Column Names and the datatypes of the table.

ERD Symbols

Entity – also known as a column and shows its attributes.



First_Name, Last_name and Phone_Number are Attributes of the Entity Customer.

We now have the Table Name, Column Names and the datatypes of the table and possible constraints.

ERD Symbols

Relationship – The interaction between entities. It will have an indicator which is an attribute of one entity refers to another entity. Usually done with a Primary Key / Foreign Key reference.

Cardinality – Refers to the maximum number of times an instance can relate to another instance.

One to One	1:1
One to Many	1:M
Many to one	M:1
Many to Many	M:M

Cardinality Relationships

One to One	1:1
One to Many	1:M
Many to One	M:1
Many to Many	M:M

Depending on the format being used and there are several with each one having a different appearance when the ERD is diagramed.

Checking the Cardinality

To give you an idea of how it looks you can do the following to see your actual databases being used in this class.

Go to Sql Server Management Studio >

Object Explorer >

Databases >

Choose and expand your Database.

Under your database right click on "Database Diagrams" and select "New Database Diagram".

It will a open a new window. Choose tables to include in ER-Diagram (to select multiple tables press "ctrl" or "shift" button and select tables).

Click add.

Wait for it to complete. Done!!