Database Design Guide

This guide will help the student to create a database on the Chromoweb (Web Consultancy Services). It will help to manage the below functionalities.

- Customer details
- Template details
- Quotation details
- Portfolio details
- Payment details
- Services details
- Feedback

We will use MySQL as the DBMS to create the database and its related operations.

1. Introduction to MySQL

MySQL is an open-source relational database management system (RDBMS) that uses structured query language (SQL) to manage and manipulate data in a database. It is widely used for various applications, from small web applications to large enterprise systems.

MySQL's key features include:

- Scalability: Capable of handling large amounts of data and concurrent connections.
- Flexibility: Supports various data types and storage engines.
- Performance: Optimized for speed and efficiency.
- Reliability: Known for its stability and robustness.

2. Installation of MySQL

MySQL can be installed on various operating systems, including Windows, macOS, and Linux. Here are the general steps to install MySQL:

Windows:

- Download the MySQL installer from the official website. https://dev.mysql.com/downloads/installer/
- Run the installer and follow the on-screen instructions.
- Choose the installation type (Typical, Complete, or Custom). Recommended Custom.
- Set a root password for the MySQL server.

3. E-R Diagram (ERD)

An Entity-Relationship Diagram (ERD) is a visual representation of the data model that shows the entities, attributes, relationships between entities, and cardinality. ERDs are commonly used in database design to help developers and stakeholders understand the structure and relationships within a database.

Identify Entities

- Start by identifying the main entities in your system. These are the objects or concepts about which you want to store data.
- Each entity should correspond to a table in your database.

Define Attributes

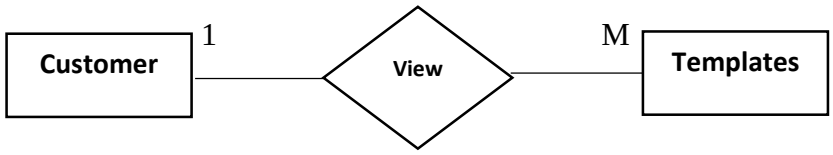
- For each entity, list the attributes (properties or fields) that describe it.
- These attributes will become columns in the corresponding database table.

Identify Relationships

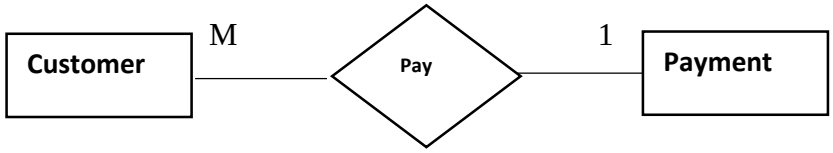
- Determine how entities are related to each other. There are three types of relationships: one-to-one (1:1), one-to-many (1:N), and many-to-many (N:M).
- Represent these relationships using lines connecting the entities.

Let's see a few examples of relationships:

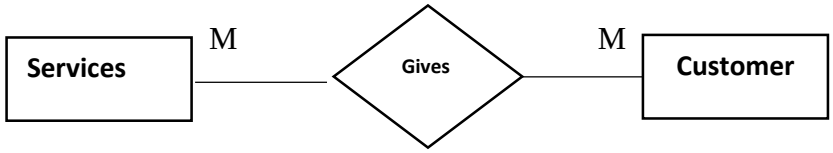
One to Many



Many to One



Many to Many



Cardinality Notation

Cardinality represents the number of times an entity of an entity set participates in a relationship set. Or we can say that the cardinality of a relationship is the number of tuples (rows) in a relationship.

- Use notation (such as Crow's Foot Notation or Chen Notation) to indicate the cardinality of each relationship.
- Cardinality describes how many instances of one entity are related to how many instances of another entity.
- Common notations include:
  - One (1)
  - Zero or one (0..1)
  - Many (N)
  - Zero or many (0..N)

Optional:

Add Attributes and Constraints

- Include additional information in your ERD, such as primary keys, foreign keys, and constraints (e.g., unique constraints).

Create the Diagram

- Use specialized diagramming software or tools (e.g., Lucidchart, draw.io, or even pen and paper) to create your ERD.

Refine and Review:

- Review your ERD with stakeholders and team members to ensure it accurately represents the data model and relationships. Make any necessary refinements.

Let's identify the entities of the Chromoweb (Web Consultancy Services)

1. Admin
2. Customers
3. Templates
4. Enquiry
5. Services
6. Payment
7. feedback

*** Now let's identify the attributes and relationships of each entity for the Chromoweb (Web Consultancy Services).

Admin

- **Attributes:**
  id
  Admin_name
  Username
  Mobilenumber
  Email
  Password
  AdminRegdate

- **Relationships:**
  One **admin** can handle more than one **customer** (One-to-Many)

Customers

- **Attributes:**
  cus_id
  CustName
  Username
  MobileNumber
  Email
  password
  CustRegDate

- **Relationships:**
  Many **customer** is views many templates (**Many-to-Many**)

Templates

- **Attributes:**
  - t_id (primary key)
  - t_name
  - t_desc
  - category
  - t_quotation
  - status
- **Relationships:**
  - One **admin** manages many **templates** (**One-to-Many**)
  - One **customer** view many **templates** (**One-to-Many**)

Enquiry

- **Attributes:**
  - e_id (primary key)
  - e_date
  - Fullname
  - Email
  - Address
  - Message
  - cus_id (foreign key)
  - t_id (foreign key)
- **Relationships:**
  - One **enquiry** have many customers (**One-to-Many**)

Feedback

- **Attributes**:
  - f_id (Primary Key)
  - f_name
  - Message
  - Mobile_number
  - cus_id (foreign key)
  - t_id (foreign key)
- **Relationships:**
  - One **Customer** gives to many feedback **(One-To-Many)**

Payment

- **Attributes**:
  - p_id (primary key)
  - p_desc
  - price
  - p_date
  - cus_id (foreign key)
  - t_id (foreign key)

Services

- **Attributes**:
  - s_id (primary key)
  - s_name
  - cus_id (foreign key)
  - validity
  - validity_startdate
  - validity_expirydate

Table Structure

1. Admin

```
mysql> desc admin;
+-------------+-------------+------+-----+-------------------+-------------------+
| Field       | Type        | Null | Key | Default           | Extra             |
+-------------+-------------+------+-----+-------------------+-------------------+
| id          | int         | NO   | PRI | NULL              | auto_increment    |
| Admin_name  | varchar(45) | NO   |     | NULL              |                   |
| Username    | varchar(50) | NO   |     | NULL              |                   |
| Mobilenumber| varchar(10) | NO   |     | NULL              |                   |
| Email       | varchar(120)| NO   |     | NULL              |                   |
| Password    | varchar(120)| NO   |     | NULL              |                   |
| AdminRegdate| timestamp   | YES  |     | CURRENT_TIMESTAMP | DEFAULT_GENERATED |
+-------------+-------------+------+-----+-------------------+-------------------+
7 rows in set (0.04 sec)
```

2. Customer

```
mysql> desc customers;
+-------------+-------------+------+-----+-------------------+-------------------+
| Field       | Type        | Null | Key | Default           | Extra             |
+-------------+-------------+------+-----+-------------------+-------------------+
| cus_id      | int         | NO   | PRI | NULL              | auto_increment    |
| CustName    | varchar(45) | NO   |     | NULL              |                   |
| Username    | varchar(50) | NO   |     | NULL              |                   |
| MobileNumber| varchar(10) | NO   |     | NULL              |                   |
| Email       | varchar(120)| NO   |     | NULL              |                   |
| password    | varchar(120)| NO   |     | NULL              |                   |
| CustRegDate | timestamp   | YES  |     | CURRENT_TIMESTAMP | DEFAULT_GENERATED |
+-------------+-------------+------+-----+-------------------+-------------------+
7 rows in set (0.00 sec)
```

3. Templates

```
mysql> desc templates;
+------------+-------------+------+-----+---------+----------------+
| Field      | Type        | Null | Key | Default | Extra          |
+------------+-------------+------+-----+---------+----------------+
| t_id       | int         | NO   | PRI | NULL    | auto_increment |
| t_name     | varchar(50) | NO   |     | NULL    |                |
| t_desc     | varchar(50) | NO   |     | NULL    |                |
| category   | int         | NO   |     | NULL    |                |
| t_quotation| varchar(20) | NO   |     | NULL    |                |
| status     | varchar(200)| NO   |     | NULL    |                |
+------------+-------------+------+-----+---------+----------------+
6 rows in set (0.00 sec)
```

4. Enquiry

```
mysql> desc enquiry;
+---------------+-------------+------+-----+---------+----------------+
| Field         | Type        | Null | Key | Default | Extra          |
+---------------+-------------+------+-----+---------+----------------+
| e_id          | int         | NO   | PRI | NULL    | auto_increment |
| Full_Name     | varchar(100) | NO   |     | NULL    |                |
| Email         | varchar(200) | NO   |     | NULL    |                |
| Mobile_number | varchar(10)  | NO   |     | NULL    |                |
| Address       | varchar(200) | NO   |     | NULL    |                |
| Message       | varchar(250) | NO   |     | NULL    |                |
+---------------+-------------+------+-----+---------+----------------+
6 rows in set (0.00 sec)
```

5. Services

```
mysql> desc services;
+---------------------+-------------+------+-----+-------------------+-------------------+
| Field               | Type        | Null | Key | Default           | Extra             |
+---------------------+-------------+------+-----+-------------------+-------------------+
| s_id                | int         | NO   | PRI | NULL              | auto_increment    |
| cus_id              | varchar(45) | NO   |     | NULL              |                   |
| service_name        | varchar(50) | NO   |     | NULL              |                   |
| validity            | int         | NO   |     | NULL              |                   |
| validity_startDate  | timestamp   | YES  |     | CURRENT_TIMESTAMP | DEFAULT_GENERATED |
| validity_expiryDate | timestamp   | YES  |     | CURRENT_TIMESTAMP | DEFAULT_GENERATED |
+---------------------+-------------+------+-----+-------------------+-------------------+
6 rows in set (0.00 sec)
```

6. Payment

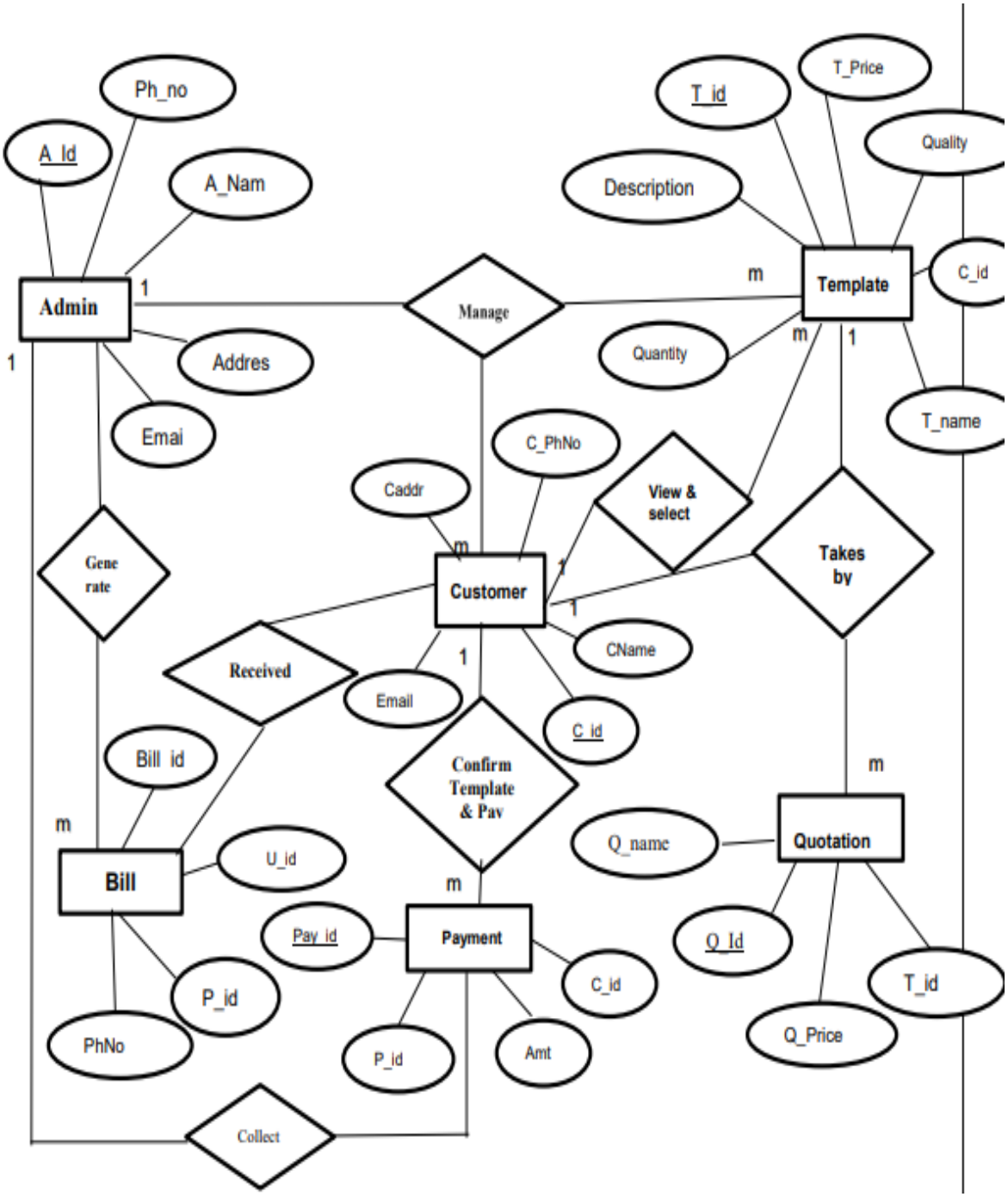
```
mysql> desc payment;
+--------+-------------+------+-----+-------------------+-------------------+
| Field  | Type        | Null | Key | Default           | Extra             |
+--------+-------------+------+-----+-------------------+-------------------+
| p_id   | int         | NO   | PRI | NULL              | auto_increment    |
| p_name | varchar(20) | NO   |     | NULL              |                   |
| Cus_id | int         | NO   |     | NULL              |                   |
| t_id   | int         | NO   |     | NULL              |                   |
| p_desc | varchar(20) | NO   |     | NULL              |                   |
| price  | int         | NO   |     | NULL              |                   |
| p_Date | timestamp   | YES  |     | CURRENT_TIMESTAMP | DEFAULT_GENERATED |
+--------+-------------+------+-----+-------------------+-------------------+
7 rows in set (0.00 sec)
```

7. Feedback:

```
mysql> desc feedback;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| f_id          | int         | NO   |     | NULL    |       |
| f_Name        | varchar(100) | NO   |     | NULL    |       |
| Mobile_number | varchar(10)  | NO   |     | NULL    |       |
| f_date        | varchar(200) | NO   |     | NULL    |       |
| Message       | varchar(250) | NO   |     | NULL    |       |
| cus_id        | int         | NO   |     | NULL    |       |
| t_id          | int         | NO   |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
7 rows in set (0.04 sec)
```

Now, let's create the ER diagram to visually represent the entities and relationships.

ERD Diagram



In this ERD:

- Customer can view, and each customer can select multiple templates, creating a many-to-many relationship.
- The Templates entity serves as a bridge table between Customer and Services entities to represent this relationship.

- Multiple Templates can be have by one Customer (many-to-one relationship).
- Each customer can select multiple templates (one-to-many relationship).
- A Customer can give multiple feedbacks

4. Creating a Database
Using MySQL server, create a new database for Chromoweb. You can do this with SQL commands or through the graphical interface.

CREATE DATABASE Chromoweb;

5. Using a Database
Before performing any operations on a database, you need to select it using the USE statement:

USE Chromoweb;

6. Creating the tables for each entity

```
CREATE TABLE admin (
  id int NOT NULL,
  Admin_name varchar(45) NOT NULL,
  Username varchar(50)  NOT NULL,
  Mobilenumber varchar(10)  NOT NULL,
  Email varchar(120)  NOT NULL,
  Password varchar(120)  NOT NULL,
  AdminRegdate timestamp NULL DEFAULT current_timestamp()
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

```
CREATE TABLE enquiry (
    e_id int NOT NULL ,
    Full_Name VARCHAR(100) NOT NULL ,
    Email VARCHAR(200) NOT NULL ,
    Mobile_number varchar(10) NOT NULL,
     Address VARCHAR(200) NOT NULL,
            Message varchar(250) NOT NULL
```

```
)ENGINE=InnoDB DEFAULT CHARSET=latin1;

drop table enquiry;
 drop table customers;



CREATE TABLE customers (
  cus_id int NOT NULL,
  CustName varchar(45) NOT NULL,
  Username varchar(50) NOT NULL,
  MobileNumber varchar(10) NOT NULL,
  Email varchar(120) NOT NULL,
  Password varchar(12) NOT NULL,
  CustRegDate timestamp NULL DEFAULT current_timestamp()
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

CREATE TABLE payment (
  p_id int NOT NULL,
  p_name varchar(20) NOT NULL,
  Cus_id int NOT NULL,
  t_id int  NOT NULL,
  p_desc varchar(20) NOT NULL,
  price int NOT NULL,
  p_Date timestamp NULL DEFAULT current_timestamp()
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

CREATE TABLE location (
  l_id int NOT NULL,
  l_name varchar(20) NOT NULL,
```

```
  Country varchar(20) NOT NULL,
  State varchar(20) NOT NULL,
  Distrinct varchar(20) NOT NULL,
  City varchar(20) NOT NULL,
  l_landmark varchar(20) NOT NULL,
  l_zipcode int NOT NULL,
  Contact_number varchar(10) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

CREATE TABLE services (
  s_id int NOT NULL,
  cus_id varchar(45) NOT NULL,
  service_name varchar(50) NOT NULL,
  validity int NOT NULL,
  validity_startDate timestamp NULL DEFAULT current_timestamp(),
  validity_expiryDate timestamp NULL DEFAULT current_timestamp()
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

CREATE TABLE templates (
  t_id int NOT NULL,
  t_name varchar(50) NOT NULL,
  t_desc varchar(50) NOT NULL,
  category int NOT NULL,
  t_quotation varchar(20) NOT NULL,
  status varchar(200) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

ALTER TABLE admin
  ADD PRIMARY KEY (id);
```

```
ALTER TABLE enquiry
ADD PRIMARY KEY(e_id);

ALTER TABLE Customers
ADD PRIMARY KEY (cus_id);

ALTER TABLE templates
ADD PRIMARY KEY (t_id);

ALTER TABLE services
ADD PRIMARY KEY (s_id);
ALTER TABLE payment
ADD PRIMARY KEY (p_id);

ALTER TABLE location
ADD PRIMARY KEY (l_id);

ALTER TABLE admin
MODIFY id int NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
ALTER TABLE customers
MODIFY cus_id int NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
ALTER TABLE enquiry
MODIFY e_id int NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
ALTER TABLE templates
MODIFY t_id int NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
ALTER TABLE location
MODIFY l_id int NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
ALTER TABLE payment
```

```
  MODIFY p_id int NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
ALTER TABLE services
  MODIFY s_id int NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
```