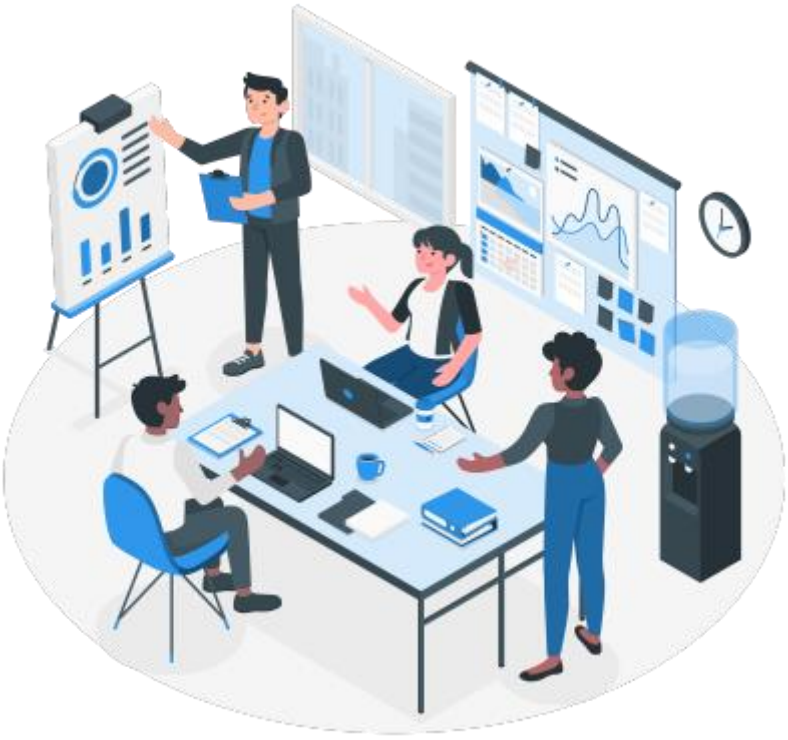
DATABASE DESIGN - A CASE STUDY

ABC EVENT MANAGEMENT COMPANY



By:

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MISSION

To deliver a well-organized and engaging sports event experience for XYZ Corp employees by efficiently managing participation in cricket and football events, while fostering teamwork, wellness, and a sense of unity among colleagues.

OBJECTIVES

- **Design and implement** a relational database to manage employee involvement in sports events organized for XYZ Corp.

- **Normalize and link** key entities — employees, sports, roles, and venues — using foreign keys to ensure data integrity and relational consistency.

- **Create dynamic SQL views** to simulate and categorize sport participation (e.g., official cricket/football participants) without inserting records into a physical participation table.

- **Automate participant filtering using SQL** conditions (PlaysCricket = 'Y', PlaysFootball = 'Y') to assign players to respective roles and venues.

TABLES

1. clientEmployees(Entity): stores detailed information of all employees provided by XYZ corp. , including their department and sport preferences (Cricket / Football via Y/N).

2. sports (Entity): Holds the list of sports (cricket , football) being organized for the event.

3. Roles(Entity): Defines the type of role an employee holds in the event - either official (player) or Unofficial(support staff).

4. venues(Entity): stores venue details including name and location where the sports event are held.

5. Sportparticipation(Process): (conceptual/virtual via views) used to link employees to the sports they are participating in, along with their roles and assigned venues. Created SQL views to simulate this participationbased on conditions like PlaysCricket = Y.

- TABLE clientEmployees

Structure

```
mysql> describe clientemployees;
+---------------+-------------+------+-----+
| Field         | Type        | Null | Key |
+---------------+-------------+------+-----+
| EmployeeID    | int         | NO   | PRI |
| FirstName     | varchar(50) | YES  |     |
| LastName      | varchar(50) | YES  |     |
| Department    | varchar(50) | YES  |     |
| PlaysCricket  | char(1)     | YES  |     |
| PlaysFootball | char(1)     | YES  |     |
+---------------+-------------+------+-----+
6 rows in set (0.01 sec)
```

Data populated

EmployeeID	FirstName	LastName	Department	PlaysCricket	PlaysFootball
101	Aman	Shah	IT	Y	N
102	Neha	Patel	Marketing	N	Y
103	Ravi	Kumar	HR	Y	Y
104	Simran	Singh	Finance	N	N
105	Aditya	Gupta	Operations	Y	N

- TABLE sports

Structure

```
mysql> describe sports;
+-----------+-------------+------+-----+
| Field     | Type        | Null | Key |
+-----------+-------------+------+-----+
| SportID   | int         | NO   | PRI |
| SportName | varchar(30) | YES  | UNI |
+-----------+-------------+------+-----+
2 rows in set (0.03 sec)
```

Data populated

```
mysql> select * from sports;
+---------+-----------+
| SportID | SportName |
+---------+-----------+
|       1 | Cricket   |
|       2 | Football  |
+---------+-----------+
2 rows in set (0.03 sec)
```

- TABLE Roles

Structure

```
+----------+-------------+------+-----+
| Field    | Type        | Null | Key |
+----------+-------------+------+-----+
| RoleID   | int         | NO   | PRI |
| RoleType | varchar(20) | YES  |     |
+----------+-------------+------+-----+
```

Data populated

```
mysql> select * from Roles;
+--------+------------+
| RoleID | RoleType   |
+--------+------------+
|      1 | Official   |
|      2 | Unofficial |
+--------+------------+
2 rows in set (0.01 sec)
```

- TABLE venues

Structure

```
+-----------+--------------+------+-----+
| Field     | Type         | Null | Key |
+-----------+--------------+------+-----+
| VenueID   | int          | NO   | PRI |
| VenueName | varchar(100) | YES  |     |
| Location  | varchar(100) | YES  |     |
+-----------+--------------+------+-----+
```

Data populated

```
mysql> select * from venues;
+---------+--------------------------+-----------+
| VenueID | VenueName                | Location  |
+---------+--------------------------+-----------+
|       1 | Greenfield Cricket Ground | Sector-21 |
|       2 | Sunshine Football Arena   | Sector-22 |
|       3 | Lakeside Sports Complex   | Sector-21 |
|       4 | Downtown Stadium          | Sector-21 |
+---------+--------------------------+-----------+
4 rows in set (0.02 sec)
```

- TABLES Sportparticipation

(conceptual/virtual via views) used to link employees to the sports they are participating in, along with their roles and assigned venues. Created SQL views to simulate this participationbased on conditions.

Views

1. How do we identify all official cricket participants?

```
mysql> CREATE VIEW OfficialCricketParticipants AS
    -> SELECT EmployeeID, 1 AS SportID, 1 AS RoleID, 1 AS VenueID
    -> FROM ClientEmployees
    -> WHERE PlaysCricket = 'Y';
Query OK, 0 rows affected (0.03 sec)
```

View

```
mysql> select * from OfficialCricketParticipants;
+------------+---------+--------+---------+
| EmployeeID | SportID | RoleID | VenueID |
+------------+---------+--------+---------+
|        101 |       1 |      1 |       1 |
|        103 |       1 |      1 |       1 |
|        105 |       1 |      1 |       1 |
|        107 |       1 |      1 |       1 |
|        109 |       1 |      1 |       1 |
|        111 |       1 |      1 |       1 |
|        113 |       1 |      1 |       1 |
|        115 |       1 |      1 |       1 |
|        117 |       1 |      1 |       1 |
|        119 |       1 |      1 |       1 |
|        121 |       1 |      1 |       1 |
|        123 |       1 |      1 |       1 |
|        125 |       1 |      1 |       1 |
|        127 |       1 |      1 |       1 |
|        129 |       1 |      1 |       1 |
|        131 |       1 |      1 |       1 |
|        133 |       1 |      1 |       1 |
|        135 |       1 |      1 |       1 |
|        137 |       1 |      1 |       1 |
|        139 |       1 |      1 |       1 |
+------------+---------+--------+---------+
20 rows in set (0.02 sec)
```

2. How do we identify all official football participants?

```
mysql> CREATE VIEW OfficialFootballParticipants AS
    -> SELECT
    ->     EmployeeID,
    ->     FirstName,
    ->     LastName,
    ->     2 AS SportID,
    ->     1 AS RoleID,
    ->     2 AS VenueID
    -> FROM ClientEmployees
    -> WHERE PlaysFootball = 'Y';
Query OK, 0 rows affected (0.04 sec)
```

View

```
mysql> select * from OfficialFootballParticipants;
+------------+-----------+----------+---------+--------+---------+
| EmployeeID | FirstName | LastName | SportID | RoleID | VenueID |
+------------+-----------+----------+---------+--------+---------+
|        102 | Neha      | Patel    |       2 |      1 |       2 |
|        103 | Ravi      | Kumar    |       2 |      1 |       2 |
|        106 | Priya     | Joshi    |       2 |      1 |       2 |
|        107 | Vikram    | Mehta    |       2 |      1 |       2 |
|        109 | Suresh    | Nair     |       2 |      1 |       2 |
|        110 | Anjali    | Verma    |       2 |      1 |       2 |
|        112 | Sneha     | Das      |       2 |      1 |       2 |
|        113 | Amit      | Sharma   |       2 |      1 |       2 |
|        116 | Pooja     | Shah     |       2 |      1 |       2 |
|        117 | Rakesh    | Patel    |       2 |      1 |       2 |
|        119 | Sanjay    | Gupta    |       2 |      1 |       2 |
|        120 | Divya     | Mehta    |       2 |      1 |       2 |
|        122 | Anita     | Rao      |       2 |      1 |       2 |
|        123 | Sunil     | Singh    |       2 |      1 |       2 |
|        126 | Meena     | Das      |       2 |      1 |       2 |
|        127 | Tarun     | Sharma   |       2 |      1 |       2 |
|        129 | Ajay      | Gupta    |       2 |      1 |       2 |
|        130 | Rekha     | Shah     |       2 |      1 |       2 |
|        132 | Kiran     | Kumar    |       2 |      1 |       2 |
|        133 | Sunita    | Mehta    |       2 |      1 |       2 |
|        136 | Sapna     | Singh    |       2 |      1 |       2 |
|        137 | Harish    | Joshi    |       2 |      1 |       2 |
|        139 | Gaurav    | Shah     |       2 |      1 |       2 |
|        140 | Lata      | Patel    |       2 |      1 |       2 |
+------------+-----------+----------+---------+--------+---------+
24 rows in set (0.03 sec)
```

3. Who are the employees participating in both Cricket and Football?

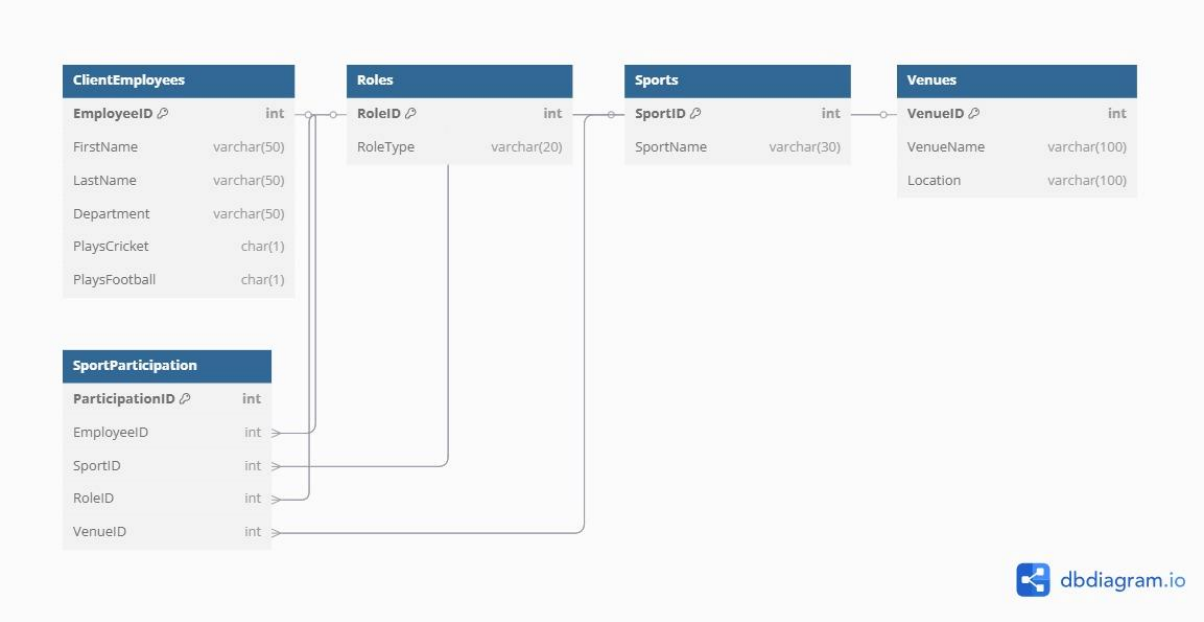
```
mysql> CREATE VIEW DualSportParticipants AS
    -> SELECT
    ->     EmployeeID,
    ->     FirstName,
    ->     LastName,
    ->     Department
    -> FROM ClientEmployees
    -> WHERE PlaysCricket = 'Y' AND PlaysFootball = 'Y';
Query OK, 0 rows affected (0.08 sec)
```

View

```
mysql> select * from DualSportParticipants;
+------------+-----------+----------+------------+
| EmployeeID | FirstName | LastName | Department |
+------------+-----------+----------+------------+
|        103 | Ravi      | Kumar    | HR         |
|        107 | Vikram    | Mehta    | Marketing  |
|        109 | Suresh    | Nair     | Finance    |
|        113 | Amit      | Sharma   | HR         |
|        117 | Rakesh    | Patel    | Marketing  |
|        119 | Sanjay    | Gupta    | Finance    |
|        123 | Sunil     | Singh    | HR         |
|        127 | Tarun     | Sharma   | Marketing  |
|        129 | Ajay      | Gupta    | Finance    |
|        133 | Sunita    | Mehta    | HR         |
|        137 | Harish    | Joshi    | Marketing  |
|        139 | Gaurav    | Shah     | Finance    |
+------------+-----------+----------+------------+
12 rows in set (0.01 sec)
```

ENTITY RELATIONSHIP DIAGRAM

An Entity Relationship Diagram (ERD) is a graphical representation that illustrates the relationships between different entities (people, objects, concepts, or events) within an information system or database. It uses data modeling techniques to define business processes and serves as the foundation for a relational database.



SQL QUERIES

1. List employees who are not playing any sport (neither Cricket nor Football).

```
mysql> SELECT
    ->     EmployeeID, FirstName, LastName, Department
    -> FROM
    ->     ClientEmployees
    -> WHERE
    ->     PlaysCricket = 'N' AND PlaysFootball = 'N';
+------------+-----------+----------+------------+
| EmployeeID | FirstName | LastName | Department |
+------------+-----------+----------+------------+
|        104 | Simran    | Singh    | Finance    |
|        108 | Kavita    | Rao      | HR         |
|        114 | Deepa     | Kaur     | Finance    |
|        118 | Neeraj    | Kumar    | HR         |
|        124 | Rina      | Joshi    | Finance    |
|        128 | Sonal     | Kaur     | HR         |
|        134 | Rohit     | Verma    | Finance    |
|        138 | Seema     | Nair     | HR         |
+------------+-----------+----------+------------+
8 rows in set (0.10 sec)
```

2. Count of Participants (Official) for Each Sport.

```
mysql> SELECT
    ->     s.SportName,
    ->     COUNT(DISTINCT sp.EmployeeID) AS ParticipantCount
    -> FROM
    ->     Sports s
    -> LEFT JOIN (
    ->     SELECT EmployeeID, SportID FROM OfficialCricketParticipants
    ->     UNION ALL
    ->     SELECT EmployeeID, SportID FROM OfficialFootballParticipants
    -> ) sp ON s.SportID = sp.SportID
    -> GROUP BY
    ->     s.SportName;
+-----------+------------------+
| SportName | ParticipantCount |
+-----------+------------------+
| Cricket   |               20 |
| Football  |               24 |
+-----------+------------------+
2 rows in set (0.10 sec)
```

3. How many employees are playing Cricket and how many are playing Football?

```
mysql> SELECT
    ->     SUM(CASE WHEN PlaysCricket = 'Y' THEN 1 ELSE 0 END) AS CricketPlayers,
    ->     SUM(CASE WHEN PlaysFootball = 'Y' THEN 1 ELSE 0 END) AS FootballPlayers
    -> FROM
    ->     ClientEmployees;
+---------------+----------------+
| CricketPlayers | FootballPlayers |
+---------------+----------------+
|             20 |              24 |
+---------------+----------------+
1 row in set (0.02 sec)
```

CONCLUSION

This database project successfully demonstrates the design and implementation of a structured system to manage a corporate sports event for XYZ Corp. By creating well-defined relational tables such as clientEmployees, Roles, sports, venues, and SportParticipation(views), we efficiently handled participant details, role assignments, sport preferences, and venue allocation. Views were used to derive insights such as official players, dual-sport participants, and department-level engagement.

The project showcases practical database concepts like entity-relationship modeling, foreign key constraints, and data normalization. It emphasizes how real-world event logistics can be digitized and streamlined using SQL, laying a strong foundation for scaling and future automation.

THANK YOU.