

CS F212 DBMS Project

Sports Management Database System

By:

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1.Description and Business rules

Scenario:

Scope: The system is designed to manage an International/Regional sports competition involving various Countries/States/Schools/Districts. Competition includes multiple sports and events. More specifically, we were having Olympics in mind while designing the Database Outline.

- **Entity Types:** The primary entity types are:
 - Players (individual athletes)
 - Teams
 - Representing Bodies (countries, states, schools, districts)
 - Sports (e.g., Athletics, Basketball, Volleyball)
 - Events (e.g., 100m Sprint, Javelin throw, Long Jump are Sub-Events in the Athletics Category)
 - Venues (stadiums, sports fields)
 - Podium.
 - Match

- **Competition Structure:**

- Players and teams represent their countries, states, schools, districts.
- Events are associated with specific sports.
- Events are held at designated venues.
- Each event has defined results (1st, 2nd, 3rd place winners and past records).

Business Rules:

1. Representational Integrity:

- A player must belong to only one representing body.
- A team must belong to only one representing body.
- A player may or may not participate in team event.

2. Participation Constraints:

- A player or team can only participate in events belonging to their designated sport.

3. Event Constraints:

- An event can only be held at a designated venue.
- An event must have a specified date within the competition's timeframe.

4. Result Integrity:

- An event must have a result recorded for future references.
- Only players or teams registered for a specific event are eligible for its result placements.

- A previous record can be stored for events where applicable (for tracking progress and record-breaking).

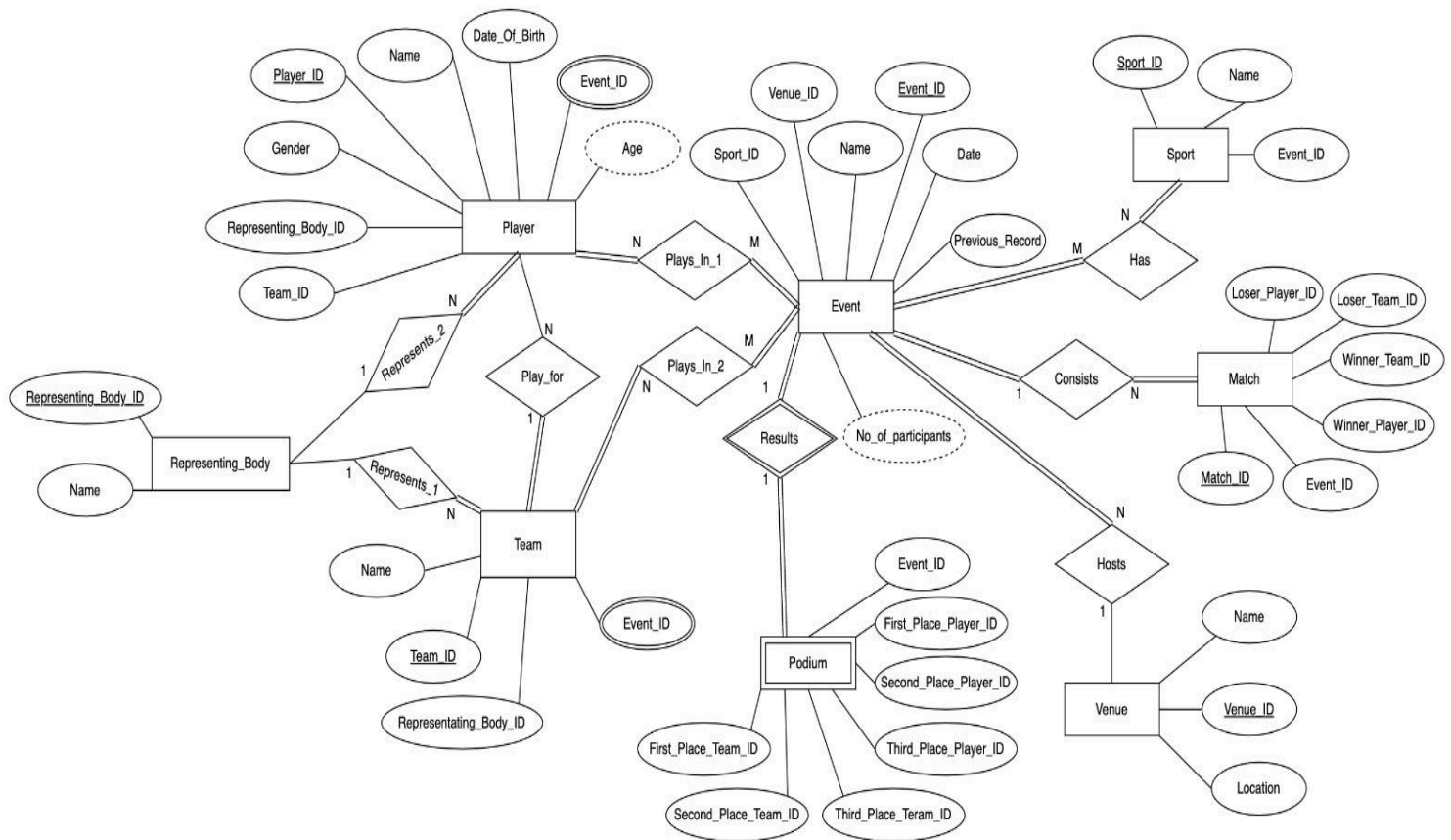
5. **Data Consistency:**

- If a player is deleted, their participation records in Player_Event should also be deleted (cascading effect).
- If a team is deleted, their participation records in Team_Event should also be deleted (cascading effect).
- If a representing body is deleted, all associated players and teams should be updated or marked **inactive**.

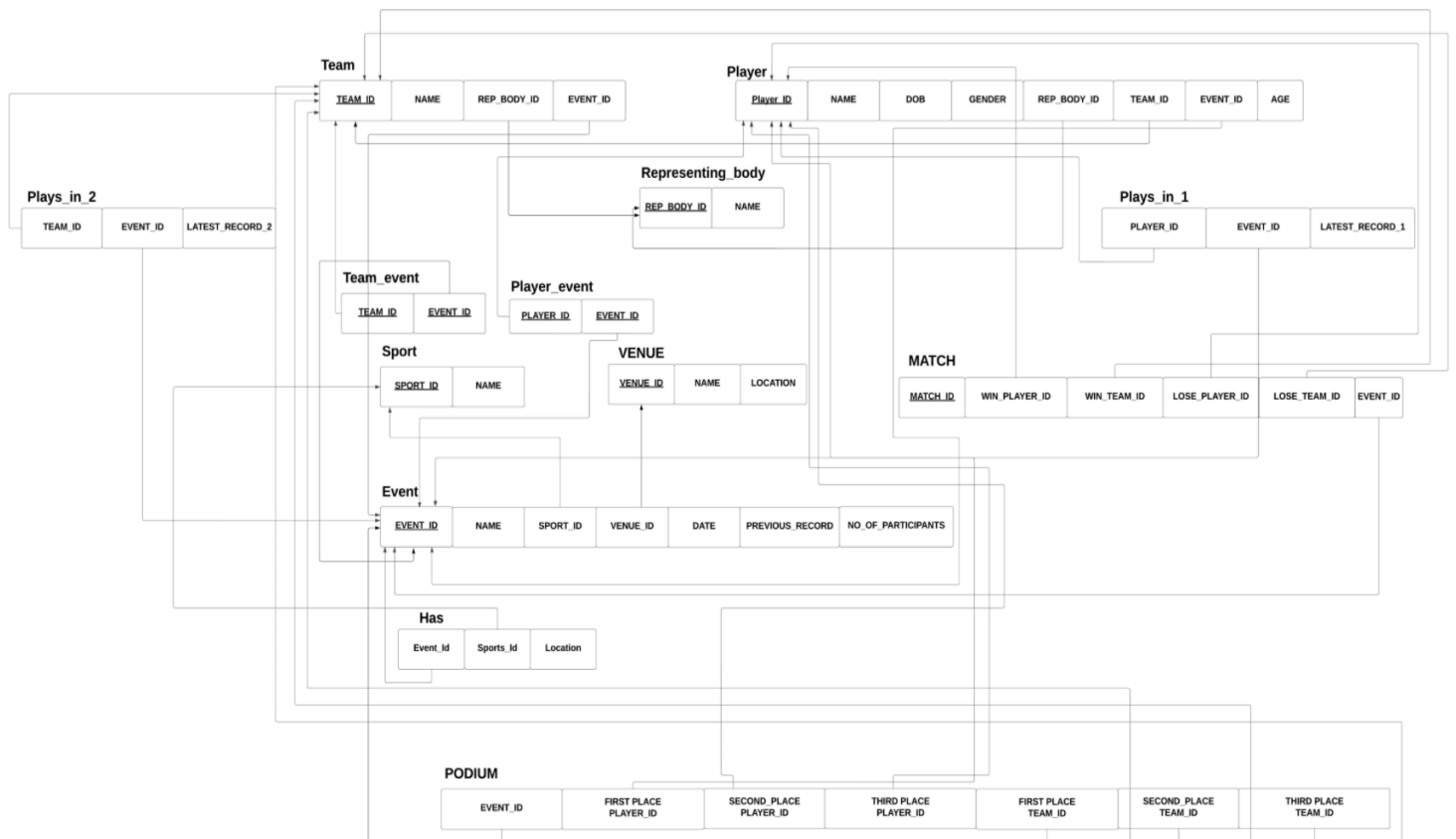
Real-World Applications:

- **School/District Sports Leagues:** Manage schedules, team standings, results, stats, and potentially facilitate communication between coaches and organizers.
Ex: Arena in BITS Hyderabad, Spree etc.
- **Amateur Sports Organizations:** Track player registrations, organize tournaments and leagues, report scores, and maintain historical records.
- **Multi-Sport Events:** Coordinate events across multiple sports, handle participant registration, venue scheduling, and manage overall results and leaderboards.

2. ER Diagram



3. Relational Mapping



Entity Types:

1. Player:

1. Player_ID (Primary Key)
2. Name
3. Date of Birth
4. Gender
5. Representing_Body_ID (Foreign Key)
6. Team_ID (Foreign Key)
7. Age
8. Event_ID (Foreign Key)

2. Team:

1. Team_ID (Primary Key)
2. Name
3. Representing_Body_ID (Foreign Key)
4. Event_ID (Foreign Key)

3. Representing_Body:

1. Representing_Body_ID (Primary Key)

2. Name

4. Sport:

1. Sport_ID (Primary Key)

2. Name

3. Event_ID (Foreign Key)

5. Event:

1. Event_ID (Primary Key)

2. Name

3. Sport_ID (Foreign Key)

4. Venue_ID (Foreign Key)

5. Date

6. No_of_participants

7. Previous_record

6. Venue:

1. Venue_ID (Primary Key)

2. Name

3. Location

7. Match:

1. Match_ID (Primary Key)

2. Event_ID (Foreign Key)

3. Winner_Player_ID (Foreign Key)

4. Loser_Player_ID (Foreign Key)
5. Winner_Team_ID (Foreign Key)
6. Loser_Team_ID (Foreign Key)

8. Podium:

1. Event_ID (Foreign Key)
2. First_Place_Player_ID (Foreign Key)
3. Second_Place_Player_ID (Foreign Key)
4. Third_Place_Player_ID (Foreign Key)
5. First_Place_Team_ID (Foreign Key)
6. Second_Place_Team_ID (Foreign Key)
7. Third_Place_Team_ID (Foreign Key)

Relationships:

- 1. Represents_1 :** (Team - Representing_Body) – Many to One
- 2. Represents_2:** (Player - Representing_Body) – Many to One
- 3. Plays_for:** (Player - Team) – Many to One
- 4. Plays_in_1:** (Player - Event) – Many to Many
- 5. Plays_in_2:** (Team - Event) – Many to Many
- 6. Hosts:** (Venue - Event) – One to Many
- 7. Results:** (Event - Podium) – One to One
- 8. Consists:** (Event - Match) – One to Many
- 9. Has:** (Event - Sport) – Many to Many

