COMP3005 Database Management Systems
Final Project 1 Report

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Sections include:

1) **Textual explanation and assumptions**
2) **Relation Schemas list**
3) **ER Diagram**
4) **Database Schema Diagram**

Conceptual Design Explanation and Assumptions

Design Assumptions:

1. Competitions/Seasons and Matches: Each match belongs to one season of a competition, but each competition season can have multiple matches (1:N).
2. Matches and Events: Each event belongs to one match, but a match can include multiple events (1:N).
3. Events and Related_Events: Events can be related to multiple other events, forming a many-to-many (N:M) relationship within Events.
4. Matches and Stadiums: Each match is played in one stadium, while a stadium can host multiple matches (1:N).
5. Matches and Referees: Each match is officiated by one referee, but referees can officiate multiple matches (1:N).
6. Managers and Matches: Managers manage teams, not direct matches. Therefore, the relationship between Managers and Matches is indirect, mediated through Teams, which is a many-to-many (N:M) relationship because managers can manage different teams over different matches.
7. Players, Matches, and Events: Players are involved in events within matches, establishing a complex many-to-many (N:M) relationship, as players participate in multiple matches and contribute to multiple events.
8. Teams and Players: Players and teams are central to match events. Player details include potentially changeable attributes like 'jersey_number', which are related to specific matches and even part of Lineups.
9. Teams and Managers: Manager data includes a 'dob' attribute, indicating individual records are stored for each manager.
10. Cards, Positions, and Players/Matches: Both Cards and Positions are directly related to specific matches and players, indicating many-to-one (N:1) relationships with both Players and Matches, as multiple cards and position records can be associated with single matches or players.

Table names and their features:

Competitions/Seasons:
Captures the overarching competition details and their respective seasons. Each competition can have one season. It includes all the competition information and points to the Matches Entity.

Matches:
Stores each match's details. A match is associated with a specific competition and season, implying a many-to-one relationship with the Competitions/Seasons entity.

Events:
Represents specific incidents or actions during a match, such as goals, fouls, and substitutions. Each event is linked to a specific match, indicating a many-to-one relationship with Matches.

Related_Events:
Some events are related to others. This entity captures such relationships, suggesting a many-to-many relationship within Events itself.

Stadiums:
Contains information about the venues where matches are played. Matches are linked to stadiums, indicating a many-to-one relationship with Stadiums.

Referees:
Details about the officials overseeing the matches. Each match is officiated by a referee(some don't have a referee), establishing a many-to-one relationship with Matches.

Managers:
Information about team managers. Managers are related to Teams, which indirectly relates them to Matches through team participation. This suggests a many-to-many relationship between Managers and Matches, mediated through Teams.

Players:
Stores player specifics. Players participate in matches, leading to a many-to-many relationship between Players and Matches, likely mediated through an entity capturing player appearances in matches.

Lineups:
Acts as a linking entity between Players and Matches/Teams. It has a many-to-many relationship with Teams(/matches).

Teams:
Teams have a many-to-many relationship with Players through Lineups, this setup supports players moving between teams and participating in various matches.

Cards:
Captures disciplinary actions (red/yellow cards) issued to players during matches. It has a many-to-one relationship with Players and Matches.

Positions:
Details about player positions at various times during a match. This suggests a many-to-one relationship with Players and Matches.

Reduction to Relation Schemas

Entities and their attribute:

- Competitions/seasons
    - competition_id(PK)
    - season_id(PK)
    - country_name
    - competition_name
    - competition_gender
    - competition_youth
    - competition_international
    - season_name
    - match_updated
    - match_updated_360
    - match_available_360
    - match_available
- Matches
    - match_id(PK)
    - match_date
    - kick_off
    - home_score
    - away_score
    - last_updated
    - last_updated_360
    - match_status_360
    - match_status
    - data_version
    - shot_fidelity_version
    - xy_fidelity_version
    - match_week
    - competition_stage
    - competition_id(FK)
    - season_id(FK)
    - home_team_id(FK)
    - away_team_id(FK)
    - home_team_manager_id(FK)
    - away_team_manager_id(FK)
    - stadium_id(FK)
    - referee_id(FK)
- Events
    - event_id(PK)
    - index
    - period
    - timestamp
    - minute

    - second
    - type_name
    - possession
    - possession_team_id(FK)
    - play_pattern
    - team_id(FK)
    - player_id(FK)
    - match_id(FK)
    - position_name
    - duration
    - under_pressure
    - counterpress
    - events_details

- Related_events(weak entity)
    - event_id(PK, FK)
    - related_event_id(PK, FK)
- Stadiums
    - stadium_id(PK)
    - country_name
    - stadium_name
- Referees
    - referee_id(PK)
    - referee_name
    - country_name
- Managers
    - manager_id(PK)
    - manager_nickname
    - country_name
    - manager_name
    - dob
- Players
    - player_id(PK)
    - player_name
    - player_nickname
    - jersey_number
    - country_name
- Lineups(weak entity)
    - player_id(FK)
    - match_id(FK)
    - team_id(FK)
- Teams
    - team_id(PK)
    - team_name
    - team_gender
    - team_group
    - country_name
- Cards(weak entity)

    - card_type
    - period
    - time
    - reason
    - player_id(FK)
    - match_id(FK)
- Positions(weak entity)
    - start_reason
    - to_period
    - to_time
    - from_period
    - position
    - end_reason
    - player_id(FK)
    - match_id(FK)
    - from_time

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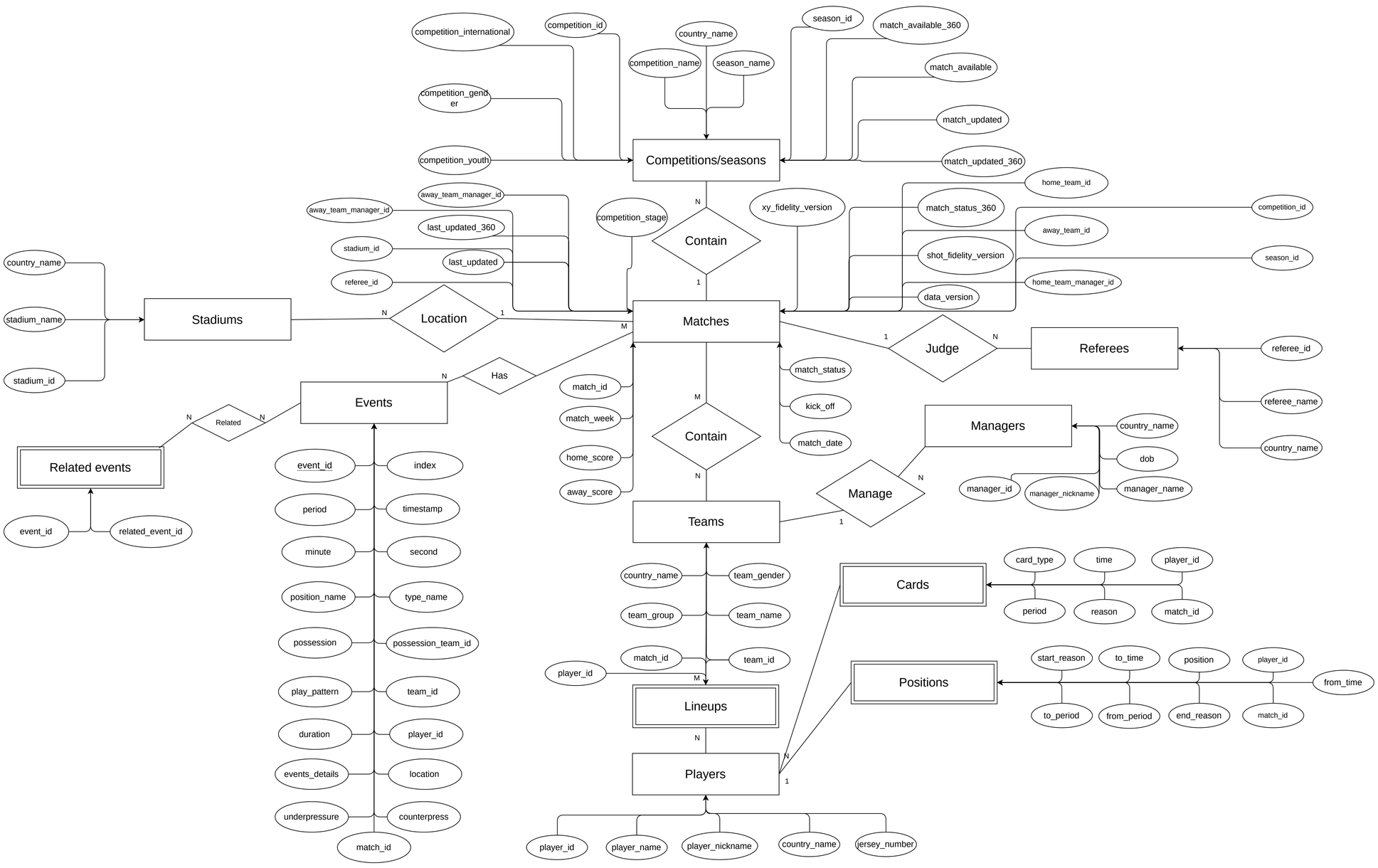
ER Model



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Schema Diagram