

Basketball League Data Management System

Database Specification: Purpose, Entities, Relationship of Entities, Business Problems

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Database Purpose:

The purpose of this database is to maintain the data which will be used to implement statistics on NBA single-season games, transfers and peripheral merchandise sales data. The work will help the association monitoring the games, transfers and peripheral merchandise sales. The database will be used by NBA league administrators, gambling analyst, relevant management departments of the government, journalists, basketball fans, players and coaches.

Business Problems Addressed:

- League managers can monitor league operations more scientifically and accurately.
- Gambling analysts can make more convincing judgments on trends, enhancing the appeal of the ball game gambling market.
- Help the government to conduct more in-depth supervision of the league, so that the credibility of the league can be guaranteed, so that the relevant market can be more stable.
- It enables journalists to obtain more comprehensive data and write more convincing articles that can be read more. On the one hand, it enhances the influence of the league and expands the league market, and on the other hand, it helps the media to obtain more benefits.
- Allow fans to have a more comprehensive and holistic experience of the league and stimulate market vitality.
- Help players and coaches analyze game tactics and help them arrange more scientific and accurate game and training plans.

Business Rules:

- Each game may have two teams, one is home team, the other is away team.
- Each game may have unique date and ID.
- Each game may have zero to many audiences.
- Each game may have one to many referees.
- Each game may locate in one city.

- Each team may have zero to many players.
- Each team may have zero to many fan clubs.
- Each team may have one coach.
- Each team may have one Training Hall.
- Each team may use one stadium as its home.
- Each Related-shops may have zero to many orders.
- Each order may have one jersey.
- Each jersey may represent one player.
- Each jersey may have unique price.
- Each player may be in or not in the hall of fame.
- Each player may have one Player Performance per game.
- Each Transfer Offer may trade one player.
- Each Transfer Offer may have one to many sponsors offer.
- Each manager may have zero to many Transfer Offer.
- Each manager may have one to many players.

Entities:

1.Stadium

To hold the data that shows the stadium's city, team and seats information.

Entity Stadium is related to entity Related_Shops, there can be several shops in a stadium, and entity Stadium is related to entity Teams as well because each team has its home stadium.

2.Related_Shops

To hold the data that shows which stadium the shop is located in.

Entity Related_Shops is related to entity Stadiums, shops can be located in any stadium and when a jersey is sold in a shop, there will be an order, so entity Related_Shops is related to entity Orders as well.

3.Orders

To hold the data that shows which jersey is sold in which shop.

Entity Orders is related to entity Jerseys, an order shows there is a jersey sold, and shows where the jersey is sold, so entity Orders is related to entity Related_Shops.

4.Jerseys

To hold the data that shows which player wears this jersey and the jersey's price.

Since a jersey represents a player, there is a one-to-one relationship between Entity

jerseys and Players.

5. Player Performance

To hold the data that shows the player's score, rebound and assistance number in a game. If a player plays in a game, there will be a statistic of this player in the game, and several players can play in a single game, so there is a many-to-one relationship between entity Players and entity Player Performance and there is a many-to-one relationship between entity Player Performance and entity Games.

6.Game

The game entity is used to collect information about each game and is the one of the most important entities of the database. The game entity's primary key, GameID, relates it to Team, Audience, Referee and Player Performance. FK HomeID and GuestID is related to Team. FK City ID is relayed to City entity.

7.Audience

The audience entity is used to store various information about the audience. The Audience's primary key, AudienceID, relates it to Fan club and, FK GameID is related to Game.

8. Referee

Each game must have a referee. This entity is used to store RefereeID and referee name of each game.

9. City

The City entity provides located information of each stadiums.

10.Training Hall

The Training Hall entity is for each team's training ground.

11.Hall of Fame

This entity stores players who join the Hall of Fame.

12. Transfer order

As for the Transfer market, there are three entities. The first one is sponsor offers. The transfer order is to switch the players between teams. The manager can manage the switches of players and place orders. The entity can also reflect the price and date of the transfer order.

One transfer can have many Sponsors Offers, however, one sponsor offers can only provide to one transfer.

13. Sponsor offer

The Sponsor offer is the second transfer market entity. The sponsor offers money to the transfer order so that they can transfer players. The entity also reflects the sponsor who provides the money.

One sponsor offer can only provide to one transfer order, but one transfer order can have many sponsor offers.

14. Manager

The manager is the third transfer market entity. The manager can manage the transfer order and the players in the team. The entity also reflects the name of the manager.

One manager can manage many transfers, however, one transfer can only have a manager.

15. Fan club

The fan club includes the fans of each team. It is used to reflect the environment of the market integrally. Each club has an ID, and name.

A Fan club can only support one team, however, one team can have many fan clubs.

16. Coach

The team will track the information of coach information, such as Coach ID, Coach first name and last name. It is important to gain information about how the coach will have an influence on the team and players.

The coach entity is closely related to the team. The relationship between coach and team is one-to-one relationship.

17.Team

One of the primary purposes of this database is to collect the Team information and analyze the information of the basketball league. It is essential to track this information cause the team is closely connected to the fan club, audience, game event, training hall, and stadiums.

The team entity is directly related to the coach, training hall, stadiums. The relationship between these three entities is one-to-one. The relationship between team and player, fan club, game is one to many. Because one team will be trained by one coach in one training hall and stadiums. It will have multiple players and many fan clubs and plenty of games.

18. Player

The players play an important role in the teams. The performance of the players need to be tracked. Sometimes when a contract between a play and the team ends, the player need to transfer to another teams. Besides, each player have their unique Jerseys.

The player entity is directly closely connected to the team, player performance, Jerseys, hall of fame, manager, and transfer order. The relationship between player and transfer order is one-to-one. The relationship between player and performance is one-to-many. Because one player can have different performance during different match. The player will have it's own unique Jerseys and transfer order.