COMSW 4111 001: Introduction to Databases

Project Part 1

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Our team would like to build a relational database that gives us a scope of how NBA league and its members behave and how do they connect to each other. With this database, you can find out each team's actions and basic stats during the season(# of wins, players, salaries, trades, picks), each player's shot result during one specific game. The key challenge here is to identify the relationship between each identity because the shot, game, team and action could be quite complex and ambiguous. Especially during the entire season, the team might trade players with another team, requiring big adjustment to the database.

This project is going to include the following entities: NBA players, Teams, game stats(win/lose/ point), shot stats(shot distance, results, etc), home stadium, news, and coaches. The relationships will include "belongs" - which players belong to which team, "shot" - players will make shots during one game, etc. A more detail example could be shown below. And we would like to expand it in the future work.

There are several constrains and assumptions applying on the ER diagram, which are:
Team & Coaches:

- All teams will have a main coach, and a coach can only be the main coach for one team
- Coach table contains some coaches not hired by the team

Team & Stadium:

- Each team will have its own home stadium(arena), and all stadiums host at least one team's home game
- Some stadium may be the home arena for multiple teams, such as Staples Center

Team & Game:

- Each game can only have one home team and one away team
- Teams will have many games (both play home or away) in the season

Game & Stadium:

- Each game is hosted in the home team's arena, and can only be in one stadium

Team & Player:

- Players only play for one team (we assume that all data are recorded after the trade deadline, which means the the relation is fixed. And this could be one of the improvement in the future to include the trade adjustment
- Some players may be laid off so he is not in a team

Player & Player_News:

- News are all about the players, not only about the league or the team
- There may be several players involved in one new

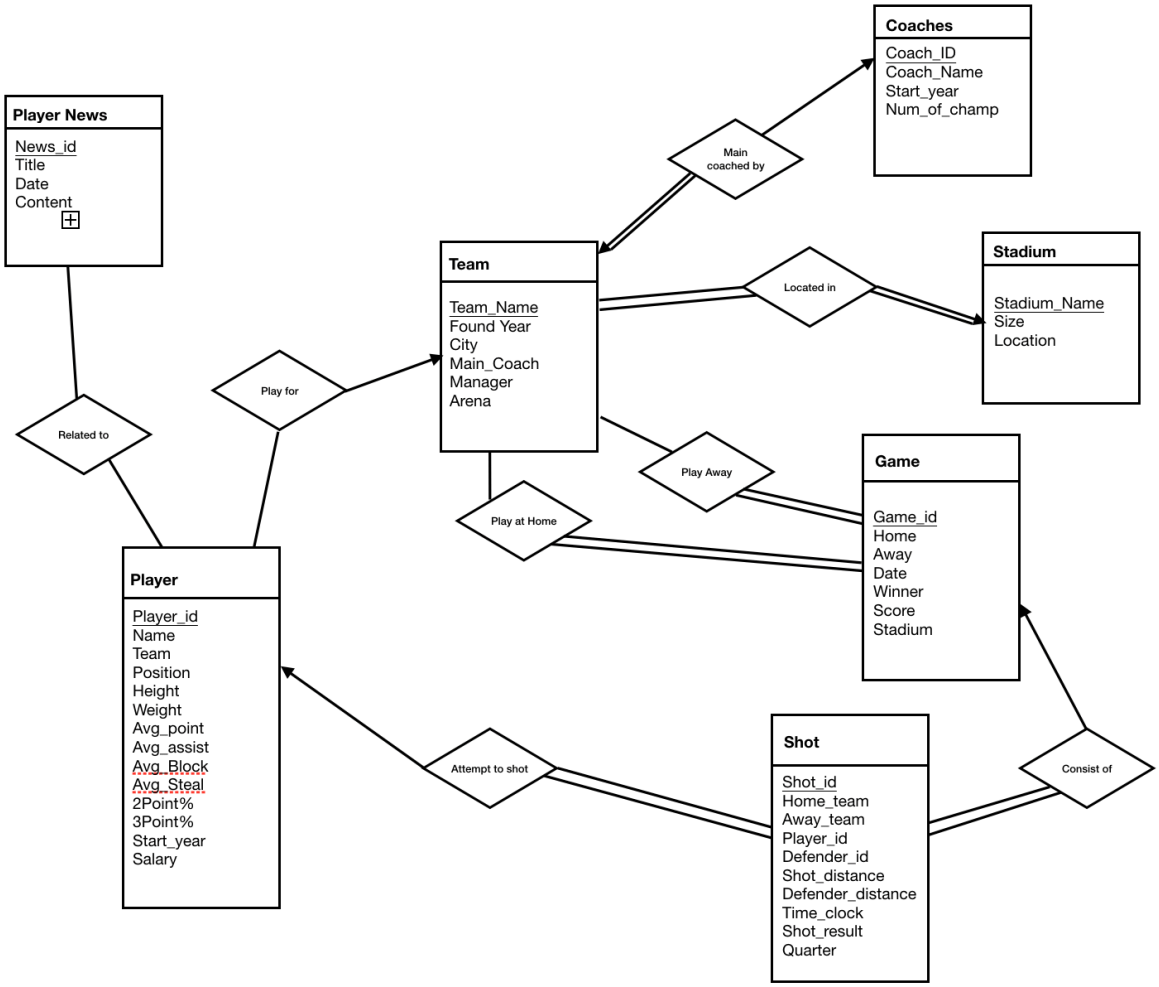
Player & Shot:

- All shot records are made by players in this season
- Players might shot multiple times in one game or many games

Game & Shot:

- All shot records can be chased back to one game
- There is no free throw record in the shot table

And the ER diagram is shown below:



Data plan: we are planning to collect data about teams and players from NBA.com, and shot and game results from Kaggle (which it has a shot dataset on 2016) and other sport website.

Some sources are linked below:

All player info: https://www.kaggle.com/drgilermo/nba-players-stats

Shot info: https://www.kaggle.com/dansbecker/nba-shot-logs

Arena list: https://en.wikipedia.org/wiki/List_of_National_Basketball_Association_arenas

NBA game schedule: https://www.basketball-reference.com/leagues/NBA_2016_games.html

Part 3 User interaction Plan: We would like to provide our users with a web-based platform where they can search their interested players and see his seasonal stats, and how he perform in each game during the entire season (visualization could be done here). Also, if someone wants to know more about his/her favorite team, he/she can click the team and see team's game schedule, past records, news, team info etc. And we can use different visualization factor to demonstrate those results.