

Football League DB Modeling

A football league is composed of four divisions each containing many different teams, where each team has a unique name (e.g. Manchester united, Sheffield Wednesday etc.), and the number of points each team has amassed so far in the league competition. Information is also stored concerning each team's captain, and home ground address. The names of all professional footballers (not unique) in the league and the teams for which they play is stored in the database. Also maintained in the database for each player is a record of their ability in the following positions (goalkeeper, defender, midfielder, striker) in a football team. A player can have the ability to play in more than one position. For example, a footballer named Alan Shearer, position = 'Defender', expertise = 2, however for position = 'Striker', expertise = 11).

(a) Draw a Functional Dependency diagram for the relations in the above database stating any assumptions made in your solution.

(b) Derive a set of fully normalised relations from the determinancy diagram, indicating clearly the primary key (candidate identifier(s)) and foreign keys of each relation. Also indicate any constraints on column values you may deem important.

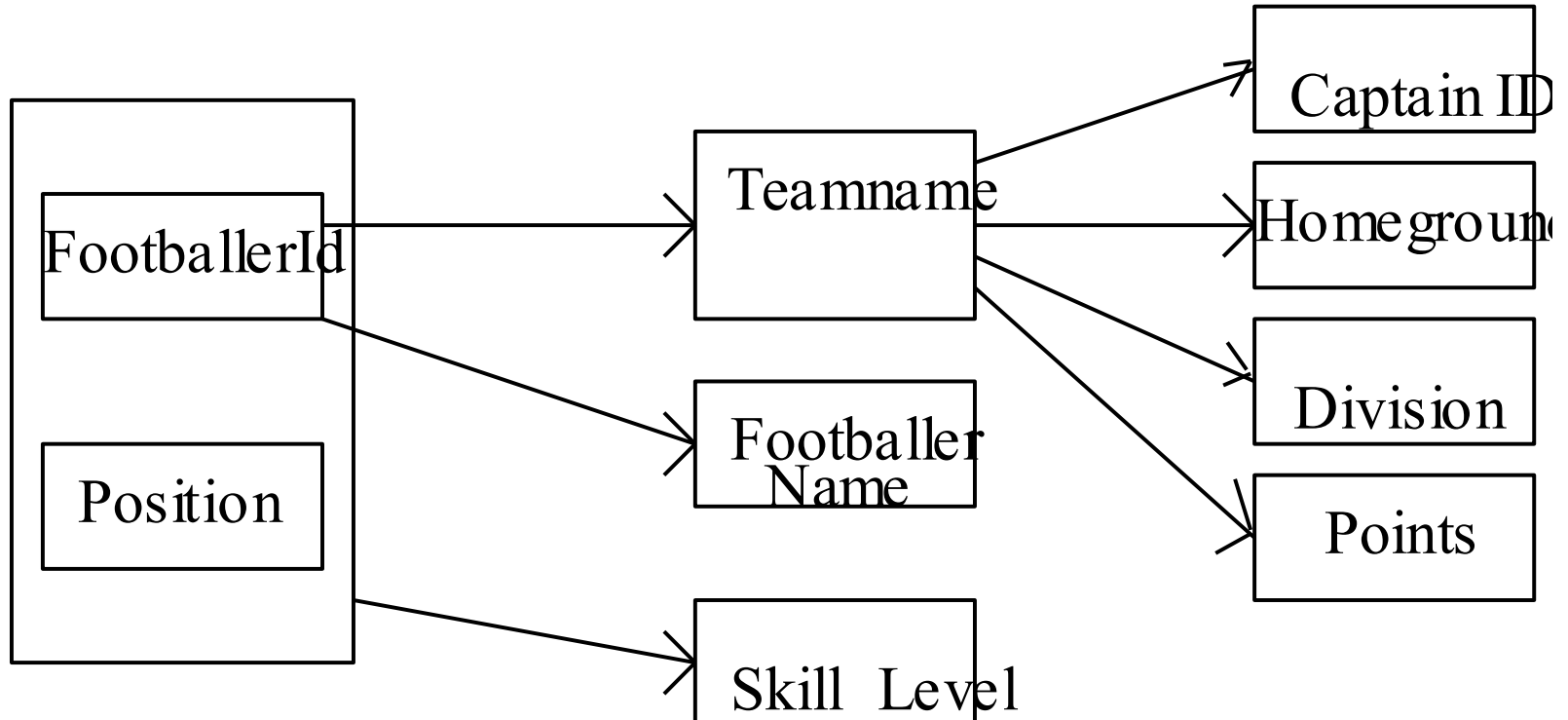
Methodology

- Underline NOUNS as potential attributes needing to be modelled write out the nouns on a white piece of paper with a box drawn around each
- Identify the determinancy relations between attributes (i.e. ask yourself “for a given value of X – is there one and only one attribute value of Y – if yes then X is a determinant of Y)
- Draw arrows between the identified determinant and the attribute(s) it determines.
- Identify if there are any multi-determinants i.e for a given value of X there can be multiple values of Y but for a given value of Y there are multiple values of X – but together X & Y determine a relationship. Draw a box around the two (Or more) multi determinants
- Divide up the boxes into separate diagrams that each one as one box acting as a single (identifying) determinant
- Define a relational table for each diagram

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Functional Dependency Diagram



Normalised Relations:

Footballer (FootballerId, FootballerName, Teamname)

Team (Teamname, CaptainId, Homeground, DivisionNumber, points)

FootballingSkills (FootballerId, Position, Skill_level)

Primary Keys (underlined above)

Foreign Keys

-) captainId in Team is a foreign key of FootballerId in Footballer
-) FootballerId in FootballingSkills is a foreign key of FootballerId in Footballer
-) Teamname in footballer is a foreign key of Teamname in Team.

Constraints

Integrity constraints on captainid (in Team), FootballerId (in Footballing Skills) & Teamname in Footballer.

NOT NULL for primary keys - also unique valued

Attribute/Table constraints

Points should have attribute (table) constraint >0

Division should have attribute (table) constraint in value set 1,2,3,4

Position should have attribute (table) constraint goalkeeper, defender, midfielder, striker

Skills level should be > 0

