



**CASE STUDY
OF
FOOTBALL LEAGUE MANAGEMENT
IN
RELATIONAL DATABASE DESIGN**

CASE STUDY IN RELATIONAL DATABASE DESIGN

Football League Management Database

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ABSTRACT

The objective of this thesis is to manage the statistics of football league tournament in university. One case study “Football League Management” is presented. Input for this case study is taken from its informal specification to a relational schema using entity-relationship modelling and its translation to relational model, to database schema, to implementation of the database, to interactive SQL querying of the installed database (SQL/Oracle).

ACKNOWLEDGEMENTS

I would like to express my gratitude to all those who made it possible to complete this thesis, in particular to my supervisor Mrs. Sarita Simaiya, I would also like to thank my family for their understanding and continuous support.

Chapter 1

Introduction

- **Database Management System**

Database management systems are software which are used to store, retrieve and run queries on data or basically managing the data. For example: - MySQL, Oracle etc are very popular commercial database which is used in different applications. It provides an interface to perform various operations like database creation, storing data in it, updating data, creating a table in the database and lot more. It provides protection and security to the database and also maintains data consistency in the case of multiple users.

- **Relational Database Management System**

A relational database management system (RDBMS) is a collection of programs and capabilities that enables the user and others to create, update, administer and otherwise interact with a relational database. RDBMS stores data in the form of tables, with most commercial relational database management systems using Structured Query Language (SQL) to access the database. The RDBMS is the most popular database system among organizations across the world. It provides a dependable method of storing and retrieving large amounts of data while offering a combination of system performance and ease of implementation.

- **ER Diagram**

ER Diagram stands for Entity Relationship Diagram, also known as ERD is a diagram that displays the relationship of entity sets stored in a database. In other words, ER diagrams help to explain the logical structure of databases. ER diagrams are created based on three basic concepts: entities, attributes and relationships. ER Diagrams contain different symbols that use rectangles to represent entities, ovals to define attributes and diamond shapes to represent relationships. At first look, an ER diagram looks very similar to the flowchart. However, ER Diagram includes many specialized

symbols, and its meanings make this model unique. The purpose of ER Diagram is to represent the entity framework infrastructure.

Following are the main components and its symbols in ER Diagrams:

- * Rectangles: This Entity Relationship Diagram symbol represents entity types.
- * Ellipses: Symbol represent attributes.
- * Diamonds: This symbol represents relationship types.
- * Lines: It links attributes to entity types and entity types with other relationship types.
- * Primary key: attributes are underlined.
- * Double Ellipses: Represent multi-valued attributes.

ER Diagram Symbols:



: -- Entity



: -- Attribute



: -- Relationship



: -- Weak Entity



: -- Multivalued Attribute



: -- Weak Relationship

- **Brief introduction of Case Study**

This is a Football League Management System Database. It helps in managing the records of different seasons of different leagues of a Football Tournament. The database holds the data of previous seasons and leagues, as well as manages the ongoing league details also. Some of the tables in the league database are:

League: The league table manages the details of the league such as name, seasons, no. of teams, no. of matches etc. The league table manages the history of different seasons so that one can retrieve whatever data is needed.

Teams: This table holds the data of all the teams and their players along with the season and league they played and their number of goals.

Players: This table stores the details of the players and their positions.

Fixtures: The fixtures table holds the data of the ongoing football league and contains the details of results of all the matches.

Team Standings: This table manages the positions and the points of the playing teams of an ongoing league and it keeps getting updated after every match.

Player Standings: The totals no. of goals and assists scored by a player are stored in this table.

Season Winners: It holds the records of the winning teams of all the previous seasons of every league.

- **Objective of the Case Study**

1. Automation of the process of data handling during any football league tournament in university.
2. Management of day to day changing statistic of a Football tournament.
3. Increase in efficiency and decrease in the chance of anomaly in statistic management.
4. Easier and faster availability of information.

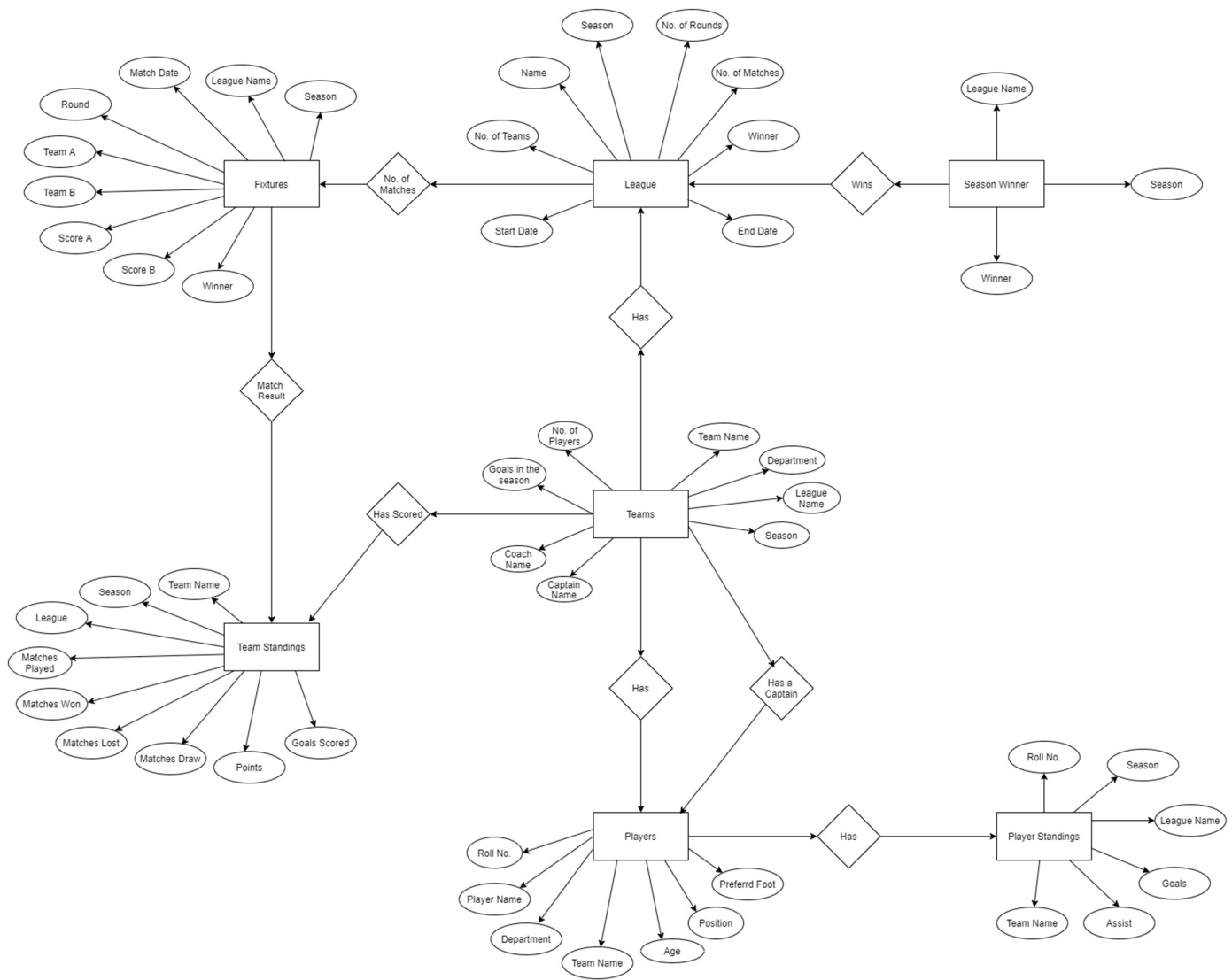
Chapter 2

Football League Management System

2.1 Case Study Informal Description

The Football League Management Database helps in managing the records and history of all the seasons of all the football leagues held in the college as well as maintains the record of an ongoing league. It has tables of fixtures, leagues, player details, team details etc. The player standings and team standings table show the records of an ongoing league and gets updated after every match. This database management system helps in easily managing the data without and data duplicacy and problem.

2.2 Case Study Logical Model



2.3 Case Study Physical Schema

TABLE FIXTURES

Column	Null?	Type
SEASON	NOT NULL	NUMBER
LEAGUE_NAME	NOT NULL	VARCHAR2(50)
MATCH_DATE	NOT NULL	DATE
ROUND	NOT NULL	NUMBER
TEAMA	NOT NULL	VARCHAR2(20)
TEAMB	NOT NULL	VARCHAR2(20)
SCORE_A	NOT NULL	NUMBER
SCORE_B	NOT NULL	NUMBER
WINNER	NOT NULL	VARCHAR2(20)

TABLE TEAM_STANDING

Column	Null?	Type
TEAM_NAME	NOT NULL	VARCHAR2(50)
LEAGUE_NAME	NOT NULL	VARCHAR2(20)
SEASON	NOT NULL	NUMBER
MATCHES_PLAYED	NOT NULL	NUMBER
WON	NOT NULL	NUMBER
DRAW	NOT NULL	NUMBER
LOST	NOT NULL	NUMBER
POINTS	NOT NULL	NUMBER
GOALS_SCORED	NOT NULL	NUMBER

TABLE LEAGUE

Column	Null?	Type
LEAGUE_NAME	NOT NULL	VARCHAR2(50)
SEASON	NOT NULL	NUMBER
NO_OF_TEAMS	NOT NULL	NUMBER
START_DATE	NOT NULL	DATE
END_DATE	NOT NULL	DATE
TOTAL_MATCHES	NOT NULL	NUMBER
TOTAL_ROUNDS	NOT NULL	NUMBER

TABLE PLAYERS

Column	Null?	Type
ROLL_NO	NOT NULL	VARCHAR2(10)
PLAYER_NAME	NOT NULL	VARCHAR2(20)
DEPT	NOT NULL	VARCHAR2(20)
TEAM_NAME	NOT NULL	VARCHAR2(20)
AGE	NOT NULL	NUMBER
POS	NOT NULL	VARCHAR2(10)
FOOT	NOT NULL	VARCHAR2(5)

TABLE SEASON_WINNER

Column	Null?	Type
LEAGUE_NAME	NOT NULL	VARCHAR2(20)
SEASON	NOT NULL	NUMBER
WINNER	NOT NULL	VARCHAR2(20)

TABLE TEAMS

Column	Null?	Type
TEAM_NAME	NOT NULL	VARCHAR2(50)
DEPT	NOT NULL	VARCHAR2(20)
LEAGUE_NAME	NOT NULL	VARCHAR2(20)
SEASON	NOT NULL	NUMBER
NO_OF_PLAYER	NOT NULL	NUMBER
GOALS_SEASON	NOT NULL	NUMBER
COACH_NAME	NOT NULL	VARCHAR2(20)
CAPTAIN_NAME	NOT NULL	VARCHAR2(20)

TABLE PLAYER_STANDING

Column	Null?	Type
ROLL_NO	-	VARCHAR2(20)
SEASON	NOT NULL	NUMBER
LEAGUE_NAME	NOT NULL	VARCHAR2(20)
GOALS	NOT NULL	NUMBER
ASSIST	NOT NULL	NUMBER
TEAM_NAME	NOT NULL	VARCHAR2(20)

2.4 Case Study Interactive Queries and Output Screenshots

Q1. List the stats of the previous season winners in the season 2019.

The screenshot shows the Oracle Live SQL web interface. The browser address bar displays the URL: `livesql.oracle.com/apex/f?p=590:1:11337794901185::LEVEL1:RP::`. The interface includes a sidebar with navigation options: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled "SQL Worksheet" and contains a text editor with the following SQL query:

```
1 select * from teams where season =2019 and team_name in (select winner from season_winner);
```

Below the query editor, the results are displayed in a table with 8 columns: TEAM_NAME, DEPT, LEAGUE_NAME, SEASON, NO_OF_PLAYER, GOALS_SEASON, COACH_NAME, and CAPTAIN_NAME. The table contains 4 rows of data, all for the year 2019.

TEAM_NAME	DEPT	LEAGUE_NAME	SEASON	NO_OF_PLAYER	GOALS_SEASON	COACH_NAME	CAPTAIN_NAME
TEAMMBA	MBA	UNIVERSITY FOOTBALL LEAGUE	2019	15	13	MODI	RAHUL
TEAMMBA	MBA	UNIVERSITY FOOTBALL LEAGUE	2019	15	13	MODI	RAHUL
TEAMCSE	CSE	UNIVERSITY FOOTBALL LEAGUE	2019	15	20	VASU	AKSHIT
TEAMCSE	CSE	UNIVERSITY FOOTBALL LEAGUE	2019	15	20	VASU	AKSHIT

Below the table, there is a "Download CSV" link and a message "4 rows selected." The footer of the page includes the Oracle logo, "Integrated Cloud Applications & Platform Services", and copyright information: "© 2021 Oracle Corporation - Privacy - Terms of Use". It also mentions "Oracle Learning Library - Ask Tom - Dev Gym - Database Documentation - Follow on Twitter" and "Live SQL 21.4.1, running Oracle Database 19c Enterprise Edition - 19.8.0.0.0". A note at the bottom states "Built with ❤️ using Oracle APEX running on Oracle Cloud Infrastructure and Oracle Kubernetes Engine".

Q2. List the team standing of previous season winners in the season 2020.

The screenshot shows the Oracle Live SQL web interface. The browser tab is 'Oracle Live SQL - SQL Worksheet'. The URL is 'livesql.oracle.com/apex/f?p=590:1:11337794901185::LEVEL1:RP:'. The interface includes a sidebar with navigation options: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a text editor with the following SQL query:

```
1 select * from team_standing where season=2020 and team_name in (select winner from season_winner);
```

Below the query editor, the results are displayed in a table with 8 columns: TEAM_NAME, LEAGUE_NAME, SEASON, MATCHES_PLAYED, WON, DRAW, LOST, POINTS, and GOALS_SCORED. The table contains 4 rows of data. Below the table, there is a 'Download CSV' link and the text '4 rows selected.'.

TEAM_NAME	LEAGUE_NAME	SEASON	MATCHES_PLAYED	WON	DRAW	LOST	POINTS	GOALS_SCORED
TEAMMBA	UNIVERSITY FOOTBALL LEAGUE	2020	3	1	1	1	4	7
TEAMMBA	UNIVERSITY FOOTBALL LEAGUE	2020	0	0	0	0	0	0
TEAMCSE	UNIVERSITY FOOTBALL LEAGUE	2020	3	2	1	0	7	9
TEAMCSE	UNIVERSITY FOOTBALL LEAGUE	2020	0	0	0	0	0	0

At the bottom of the page, there is a footer with the Oracle logo, 'Integrated Cloud Applications & Platform Services', and copyright information: '© 2021 Oracle Corporation · Privacy · Terms of Use'. It also includes links to 'Oracle Learning Library', 'Ask Tom', 'Dev Gym', 'Database Documentation', and 'Follow on Twitter'. The footer also mentions 'Live SQL 21.4.1, running Oracle Database 19c Enterprise Edition - 19.8.0.0.0' and 'Built with ❤️ using Oracle APEX running on Oracle Cloud Infrastructure and Oracle Kubernetes Engine'.

Q3. List the stats of top scorer players of previous seasons.

The screenshot shows the Oracle Live SQL interface in a web browser. The browser's address bar displays the URL: `livesql.oracle.com/apex/f?p=590:1:11337794901185::LEVEL1:RP::`. The page title is "Live SQL". On the left, a sidebar contains navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled "SQL Worksheet" and contains a text editor with the following SQL query:

```
1 select * from players where roll_no in (select roll_no from player_standing where goals in (select max(goals) from player_standing group by season));
```

Below the editor, the query results are displayed in a table:

ROLL_NO	PLAYER_NAME	DEPT	TEAM_NAME	AGE	POS	FOOT
2010991768	Vasu	CSE	TEAMCSE	20	FORWARD	R

A "Download CSV" link is located below the table. At the bottom of the page, the Oracle logo and "Integrated Cloud" branding are visible, along with copyright information: "© 2021 Oracle Corporation · Privacy · Terms of Use". Additional text includes "Oracle Learning Library · Ask Tom · Dev Gym · Database Documentation · Follow on Twitter", "Live SQL 21.4.1, running Oracle Database 19c Enterprise Edition - 19.8.0.0.0", and "Built with ❤️ using Oracle APEX running on Oracle Cloud Infrastructure and Oracle Kubernetes Engine".

Q4. List the details of players who scored in season 2018.

The screenshot shows the Oracle Live SQL web interface. The browser address bar displays the URL: `livesql.oracle.com/apex/f?p=590:1:11337794901185::LEVEL1:RP::`. The page title is "Live SQL". The left sidebar contains navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled "SQL Worksheet" and contains a text editor with the following SQL query:

```
1 select * from players where roll_no in (select roll_no from player_standing where season=2018);
```

Below the editor, the query results are displayed in a table with 7 columns: ROLL_NO, PLAYER_NAME, DEPT, TEAM_NAME, AGE, POS, and FOOT. The table contains 5 rows of data. Below the table, there is a "Download CSV" link and the text "5 rows selected.".

ROLL_NO	PLAYER_NAME	DEPT	TEAM_NAME	AGE	POS	FOOT
2010991768	Vasu	CSE	TEAMCSE	20	FORWARD	R
2010991785	ARVIND	CSE	TEAMCSE	20	FORWARD	R
2010990568	RAGHAV	CSE	TEAMCSE	19	MIDFIELDER	L
2010991783	AMAN	MBA	TEAMMBA	20	FORWARD	R
2010991568	SAMAR	MBA	TEAMMBA	19	MIDFIELDER	L

At the bottom of the page, there is a footer section with the Oracle logo, "Integrated Cloud Applications & Platform Services", and copyright information: "© 2021 Oracle Corporation · Privacy · Terms of Use". It also includes links to "Oracle Learning Library", "Ask Tom", "Dev Gym", and "Database Documentation", and mentions "Live SQL 21.4.1, running Oracle Database 19c Enterprise Edition - 19.8.0.0.0".

Chapter 3

Conclusion

To conclude the description about the project. The project, developed using Oracle and MySQL is based on the requirement specification of the user and the analysis of the existing system, with flexibility for future enhancement. this project automates the process of data handling during any football league tournament. To manage day to day changing stats of a sports tournament, database systems like this are of greater scope in coming future. Such programs increase efficiency and decreases the chance of anomaly in data management, also the updating of information becomes so easier.

This kind of management systems makes availability of any kind of Information, a task of seconds and provides accurate information. Data integrity and data security and reliability are the striking features for such management systems. It provides friendly GUI , which proves to be better when compared to existing system.

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