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Web | Data | Process

Digital Design and Management Services

Premier League Database Application [PLDB]

[PLDB] Documentation

This document provides a single resource where the details of the Premier League Database [PLDB] design, development and objectives are organised.

team	played	wins	draw	lost	goals	against	gd	points
Liverpool	21	17	3	1	49	10	39	54
Manchester City	21	16	2	3	56	17	39	50
Tottenham	21	16	0	5	46	21	25	48
Chelsea	21	13	5	3	38	16	22	44
Arsenal	21	12	5	4	46	31	15	41
Manchester Utd	21	11	5	5	43	32	11	38
Leicester	21	9	4	8	25	23	2	31
Watford	21	8	5	8	30	31	-1	29
Wolves	21	8	5	8	23	25	-2	29
West Ham	21	8	4	9	29	32	-3	28
Bournemouth	21	8	3	10	31	40	-9	27
Everton	21	7	6	8	31	31	0	27
Brighton	21	7	5	9	24	29	-5	26
Crystal Palace	21	6	4	11	19	26	-7	22
Newcastle	21	4	6	11	15	29	-14	18
Burnley	21	5	3	13	21	42	-21	18
Cardiff	21	5	3	13	19	41	-22	18
Southampton	21	3	7	11	21	38	-17	16
Fulham	21	3	5	13	19	47	-28	14
Huddersfield	21	2	4	15	13	37	-24	10

Data Storage- The database stores data for the following

- Teams - a list of teams in the premier league
- Players - a list of players from Liverpool FC
- Results - all the results from the 2018-19 season
- Fixtures - all the fixtures from jan 2019
- Honours - a list of honours earned by Liverpool FC
- Images - all the logo's for all the teams in the league

Data Manipulation

The main input and data source for the [PLDB] system is the results table, from there almost all data manipulation is formulated. For example;

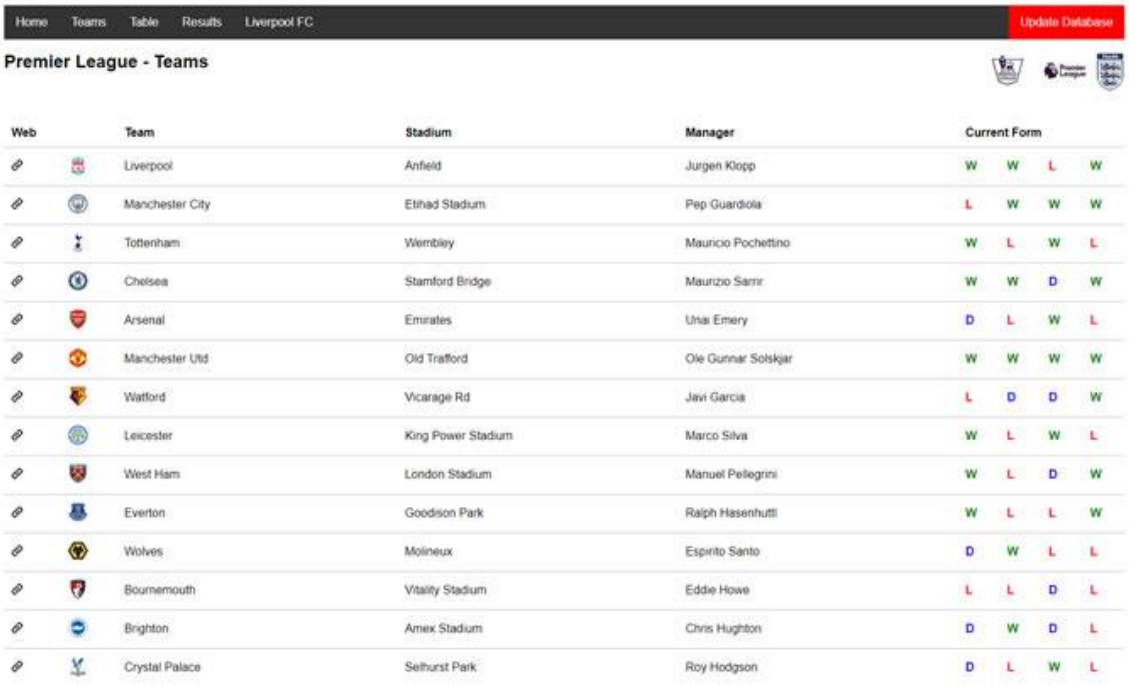
```
CREATE VIEW hf AS SELECT home_team as team, count(result_id) as pld, sum(home_score > away_score) as won, sum(home_score = away_score) as drawn, sum(away_score > home_score) as lost, sum(home_score) as goals, sum(away_score) as against, sum(home_score > away_score) * 3 + sum(home_score = away_score) as points FROM result GROUP BY home_team ORDER BY points DESC ;
```

The SQL script above calculates numerous columns for the home team, then passes that data to a new table called [hf] where that data is then used again to calculate and complete the full league table.

```
MariaDB [premier_league]> select * from hf;
+-----------------+-----+------+-------+------+-------+---------+--------+
| team            | pld | won  | drawn | lost | goals | against | points |
+-----------------+-----+------+-------+------+-------+---------+--------+
| Manchester City |  12 |   11 |     0 |    1 |    40 |      10 |     33 |
| Liverpool       |  10 |    9 |     1 |    0 |    27 |       3 |     28 |
| Arsenal         |  11 |    8 |     2 |    1 |    24 |      10 |     26 |
| Chelsea         |  12 |    7 |     4 |    1 |    21 |       9 |     25 |
| Everton         |  12 |    6 |     3 |    3 |    20 |      16 |     21 |
| Manchester Utd  |  10 |    6 |     3 |    1 |    21 |      13 |     21 |
| Brighton        |  11 |    5 |     3 |    3 |    15 |      12 |     18 |
| Tottenham       |  10 |    6 |     0 |    4 |    18 |      10 |     18 |
| Bournemouth     |  11 |    5 |     3 |    3 |    19 |      17 |     18 |
| West Ham        |  12 |    5 |     2 |    5 |    17 |      18 |     17 |
| Watford         |  11 |    5 |     1 |    5 |    16 |      18 |     16 |
| Leicester       |  11 |    4 |     2 |    5 |    13 |      12 |     14 |
| Wolves          |  11 |    4 |     2 |    5 |    12 |      15 |     14 |
| Cardiff         |  12 |    4 |     2 |    6 |    13 |      23 |     14 |
| Burnley         |  11 |    4 |     1 |    6 |    14 |      21 |     13 |
| Fulham          |  10 |    3 |     3 |    4 |    12 |      19 |     12 |
| Crystal Palace  |  11 |    2 |     3 |    6 |     6 |      11 |      9 |
| Southampton     |  10 |    1 |     5 |    4 |    11 |      17 |      8 |
| Newcastle       |  11 |    2 |     1 |    8 |     7 |      17 |      7 |
| Huddersfield    |  11 |    1 |     2 |    8 |     5 |      16 |      5 |
+-----------------+-----+------+-------+------+-------+---------+--------+
20 rows in set (0.00 sec)
```

Database

The nature of a league db is that records are not always held in the same order. This database allows the storage and manipulation of multiple types of data, not least images. Fig.2 illustrates how those images are utilised in the [PLDB].



Each image is linked to a specific team, and can be called as a graphical representation of that team whenever required.

```
$query = "Select * from current_form"; $result = mysqli_query($conn, $query);
while($row = mysqli_fetch_array($result))
src="'.base64_encode($row['logo'])
```

The PhP and SQL code snippet above demonstrates how the images were taken from the db and printed to the web page. This means, if one team were to drop position and fall to the bottom of the league their corresponding logo would move with it.

Design

The design of the db is in fact very simple. The complicated bit is keeping it simple while being able to query, present and organise data safely and accurately. The main design complication came from the fact that two teams were required to make one result. In standard db design each table holds records specific to an attribute. This was not a practical design solution as two teams would always be in the result. The solution was to separate the data into two categories and then home and away, and then use that data to produce a table

Development

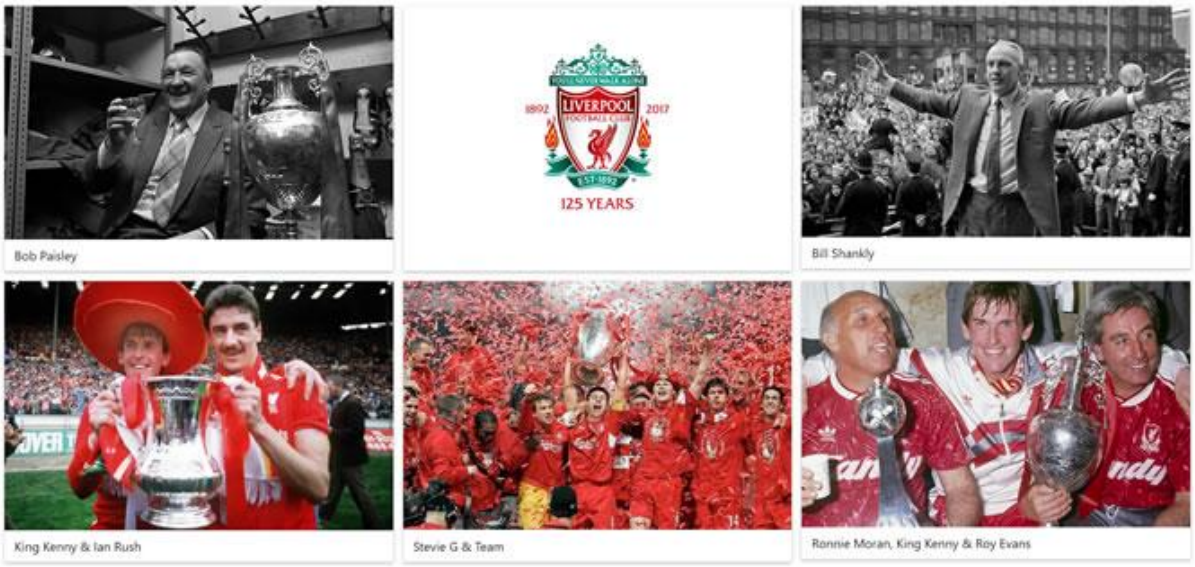
There are two logical approaches to the development of a league table. The first is to make a table and then try to populate that table with data. The second, which is the design of [PLDB] is to gather the data, and then create a table from that data. So all the data from the result is placed into two tables, hf and af, then the league is created as view of those two tables combined with all the calculations.

Testing

Testing is and always will be ongoing. However, the design and development of the system lends itself to the ACID methodology. There is little that can go wrong, the result table must be accurate and once that is the case all data will conform to Atomicity, Consistency, Isolation, Durability

Website

The website acts an interface between the database and the user. As a Liverpool fan the home page is filled with memorable moments in my teams history, indeed many pages were added to the interface that only represent Liverpool FC.



Design

The design of the site is kept simple, as its main objective is to format database results and to allow for safe inserts and updates to be made. The image above illustrates the simplicity and complexity of the design. Images, links and current form are all presented to the user in a form that is easy to understand and use. For example, the current form has the W for win, D for draw and L for lose all colour coded. Links to each teams website is presented alongside thir badge and all the data is clear and readable

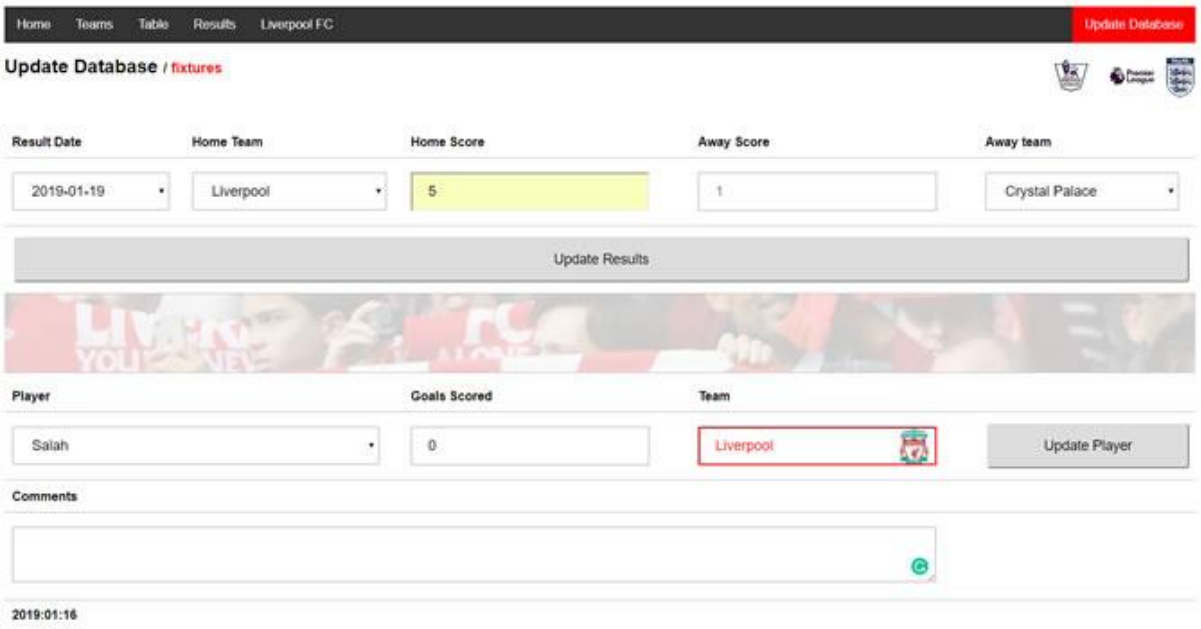
Accessibility and usability is at the heart of web design. The menu is colour coded to highlight the users current mouse over actions. All W3C standards are implemented through the site. Appropriate labels and titles are used on all elements.

Development

PhP, CSS, Java Script and HTML5 were used to implement the website. The PhP connects the site to the database and allows the user to view or update the data. The java Script was used to format the colour coded current form, illustrated in Fig.2 and the CSS to format and present the data.

Along with the pages already listed, there are four more pages that are only for admin. These pages do the grunt work and are stored in the admin folder. They do not hold data, they simply transfer data. notify the user and then return to the page data was sent from

- Update Players: updates player goals and comments
- Update Results: processes data sent from update page Fig.6
- Insert Fixtures: inserts all fixtures
- DB config: reduces the code required to connect to a database



Testing

Some fail safes have been implemented. The image above illustrates the update page, where user input occurs. This page is the most sensitive page in the site as users can make mistakes. The form was created with data from the fixtures table, so that all dates are confirmed. And a select element was used to list the teams and players, so that spelling errors cannot occur. The only place a user must take care is the goals, the correct amount of goals must be input and the correct winner must be confirmed.

$_SERVER["PHP_SELF"] exploits avoided by using htmlspecialchars().the code used to validate a number has been input. MySQL will not accept any other data type into the goals scored column