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CRAIG MARLON MAPUNGWANA

FC MARLON (FOOTBALL CLUB) DATABASE MANGEMENT SYSTEM

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Introduction

This project documents the design and implementation of a database management system for FC Marlon Football Club, addressing real-world requirements like player and staff records, contracts, loan histories, medical status, and advanced squad analysis. The system is tailored to streamline the management and retrieval of complex football club data, ensuring data consistency, accessibility, and security for authorized users only. By leveraging a relational database approach, this project minimizes redundancy, enhances data integrity, and provides real-time insights into squad composition, contract statuses, and medical fitness. It also supports key administrative functions such as player transfers, contract renewals, and loan tracking, which are pivotal for club operations. Ultimately, the DBMS empowers both management and coaching staff to make informed decisions, improves operational efficiency, and lays a foundation for future expansion of club-related analytics and services.

Aims

1. **Centralized Data Repository**

To consolidate all player, staff, contract, and medical information into a single, unified database. This eliminates data fragmentation and ensures consistency across all club departments.

2. **Automated Operational Management**

To implement automated tracking and alert systems for critical timelines like contract expirations and loan durations. This reduces administrative errors and ensures the club acts proactively on key deadlines.

3. **Advanced Squad Analysis and Reporting**

To provide real-time analytical insights into the squad, such as player distribution by position and total market value. This empowers data-driven decision-making for both coaching and management staff.

4. **Streamlined Stakeholder Access**

To facilitate secure and role-specific data access for different club stakeholders through predefined views and simplified queries. This ensures the right people get the right information efficiently without compromising security.

5. **Enhanced Data Integrity and Security**

To enforce data consistency, minimize redundancy, and control access to sensitive information. This builds a reliable foundation for club operations and protects confidential data from unauthorized exposure.

Project Objectives

- Centralize and manage player and staff data, contracts, and medical statuses:
All information is stored in a unified database, making it easier to update, search, and maintain records for players, staff, and their contract and medical details.
- Automate contract alerts and loan tracking:
The system automatically notifies administrators about upcoming contract expiries and monitors players currently on loan, reducing the risk of missed deadlines or forgotten details.

- Provide analytical reporting (e.g., squad value by position):
Generates dynamic reports and summaries such as total squad market value, player distributions by positions, and other metrics that help management make informed decisions.
- Facilitate stakeholder access through views and simplified queries:
Club managers, coaches, and staff can easily retrieve relevant information via dedicated database views and user-friendly queries, ensuring the right data reaches the right users when needed.

Scope and Limitations

The project scope encompasses managing the entire current squad, including all active players and those loaned to other clubs, as well as maintaining comprehensive staff records, player positions, nationalities, contract values, and medical statuses. It incorporates core club queries like contract alerts, loan tracking, and player fitness reports to support decision-making. For example, the system monitors contract expiry dates to avoid missed renewals and tracks players on loan to ensure timely returns. However, limitations exist due to a sample-sized dataset reflecting a single club rather than multiple clubs or leagues. The financial tracking is simplified, lacking detailed payroll or budget monitoring, and medical tracking is basic, recording only the current status without historical injury data. The system currently does not support multi-user roles or advanced access control, posing potential security risks. Additionally, there is no integration with external systems such as match statistics or ticketing platforms, limiting broader operational insights. These constraints present opportunities for future enhancements to increase system comprehensiveness and scalability.

Literature Review / Existing Systems

Existing sports management systems like CRM (Customer Relationship Management) and ERP (Enterprise Resource Planning) products offer comprehensive features covering membership management, financial tracking, event scheduling, communication, and analytics for sports clubs. However, these proprietary systems often come with limitations in transparency, as their internal workings and data handling processes are controlled by vendors, which can restrict customization and integration with club-specific needs. Bespoke SQL database management systems, such as the club-focused schema developed in this project, provide enhanced granularity and control because they allow direct design and tuning of tables, relationships, and queries tailored to the club's unique operations. This approach facilitates precise management of player contracts, loan histories, medical statuses, and staff roles with transparent business logic. It also allows more flexible reporting and future scalability aligned exactly with the club's requirements—advantages often missing in off-the-shelf CRM or ERP

sports solutions. Thus, a custom DBMS solution enables improved operational efficiency, data accuracy, and adaptability for football club management.

Methodology

System Analysis

❖ Stakeholders:

- Club management
- coaching staff
- players
- medical team

❖ Requirements

- Accurate
- timely centralized information
- robust analytics
- reliable query results for club operations

System Design

Schema Overview

Players Table

Input

```
CREATE TABLE Players (
```

```
Player_Id INT PRIMARY KEY AUTO_INCREMENT,
```

```
Jersey_Number INT UNIQUE NOT NULL,
```

```
Position VARCHAR(2) CHECK (position IN ('GK', 'DF', 'MF', 'FW')),
```

```
Full Name VARCHAR(50) NOT NULL,
```

Nationality VARCHAR(50),
Contract_Start_Date DATE),
Contract_End_Date DATE)
Market_Value DECIMAL(10,2);

Output

Player_ID	Jersey_Number	Full_Name	Position	Nationality	Contract_Start_Date	Contract_End_Date	Market_Value	Status	Medical_Status
	1	Altay Bayındır	GK	TUR	2023-07-01	2027-06-30	1500000	Active	Fit
	2	Diogo Dalot	DF	POR	2018-06-01	2026-06-30	3500000	Active	Fit
	3	Noussair Mazraoui	DF	MAR	2022-07-01	2027-06-30	2500000	Active	Fit
	4	Matthijs de Ligt	DF	NED	2022-07-01	2028-06-30	6500000	Active	Fit
	5	Harry Maguire	DF	ENG	2019-08-05	2025-06-30	2000000	Active	Fit

	6	Lisandro Martínez	D F	A R G	2022-07-01	2027-06-30	400 000 00	Active	Fit
	7	Mason Mount	M F	E N G	2023-07-01	2028-06-30	450 000 00	Active	Fit
	8	Bruno Fernandes	M F	P O R	2020-01-01	2026-06-30	750 000 00	Active	Fit
	10	Matheus Cunha	F W	B R A	2023-07-01	2028-06-30	500 000 00	Active	Fit
	11	Joshua Zirkzee	F W	N E D	2022-07-01	2027-06-30	300 000 00	Active	Fit
	12	Tyrell Malacia	D F	N E D	2022-07-01	2026-06-30	120 000 00	Active	Injured
	13	Patrick Dorgu	D F	D E N	2023-07-01	2028-06-30	150 000 00	Active	Fit
	15	Leny Yoro	D F	F R A	2024-07-01	2029-06-30	400 000 00	Active	Fit
	16	Amad Diallo	F W	C I V	2021-01-01	2026-06-30	200 000 00	Active	Fit
	18	Casemiro	M F	B R A	2022-08-01	2026-06-30	300 000 00	Active	Fit

	19	Bryan Mbeumo	FW	CMR	2023-07-01	2027-06-30	350000	Active	Fit
	22	Tom Heaton	GK	ENG	2021-07-01	2025-06-30	1000000	Active	Fit
	23	Luke Shaw	DF	ENG	2014-06-01	2027-06-30	2500000	Active	Injured
	25	Manuel Ugarte	MF	URU	2023-07-01	2028-06-30	4000000	Active	Fit
	26	Ayden Heaven	DF	ENG	2024-01-01	2026-06-30	500000	Active	Fit
	30	Benjamin Šeško	FW	SVN	2024-07-01	2029-06-30	4500000	Active	Fit
	31	Senne Lammens	GK	BEL	2023-07-01	2027-06-30	3000000	Active	Fit
	32	Chido Obi	FW	DEN	2024-01-01	2027-06-30	2000000	Active	Fit
	33	Tyler Fredricson	DF	ENG	2023-07-01	2026-06-30	1000000	Active	Fit
	35	Diego León	DF	PAR	2024-07-01	2029-06-30	8000000	Active	Fit

	37	Kobbie Mainoo	M F	E N G	2022-07-01	2028-06-30	350000	Active	Fit
	9	Rasmus Højlund	F W	D E N	2023-07-01	2027-06-30	600000	Loane d	Fit
	24	André Onana	G K	C M R	2023-07-01	2028-06-30	350000	Loane d	Fit
	36	Ethan Wheatley	F W	E N G	2023-07-01	2026-06-30	2000000	Loane d	Fit
	41	Harry Amass	D F	E N G	2023-07-01	2027-06-30	3000000	Loane d	Fit
	43	Toby Collyer	M F	E N G	2022-07-01	2025-06-30	1000000	Loane d	Fit
	44	Dan Gore	M F	E N G	2022-07-01	2026-06-30	1500000	Loane d	Fit

STAFF TABLE

Input

```
CREATE TABLE STAFF(
Staff_id INT PRIMARY KEY AUTO_INCREMENT,
Full_Name NOT NULL,
```

Role VARCHAR(100) NOT NULL,

Department VARCHAR(100),

Nationality VARCHAR(100),

Date_Joined VARCHAR(100),

Contract_End_Date DATE);

Output

Staff_ID	Full_Name	Role	Department	Nationality	Date_Joined	Contract_End_Date
	Ruben Amorim	Head Coach	Coaching	POR	2023-07-01	2027-06-30
	Carlos Fernandes	Assistant Coach	Coaching	POR	2023-07-01	2027-06-30
	Gary O'Driscoll	Head of Medicine	Medical	IRL	2022-01-01	2026-06-30
	Craig Marlon	Chairman	Management	ENG	2005-01-01	2030-06-30
	Omar Berrada	CEO	Management	ENG	2024-01-01	2029-06-30

POSITIONS TABLE

Input

CREATE TABLE Positions(

Position_ID INT PRIMARY KEY AUTO_INCREMENT,

Position_Code VARCHAR(50),

Position_Name VARCHAR(100),

Category VARCHAR(50) NOT NULL;

Output

Position_ID	Position_Code	Position_Name	Category
	GK	Goalkeeper	GK
	DF	Defender	DF
	MF	Midfielder	MF
	FW	Forward	FW

NATIONALITIES TABLE

Input

```
CREATE TABLE Nationalities(
```

```
Nationality_ID INT PRIMARY KEY AUTO_INCREMENT,  
Country_Code VARCHAR(50),
```

```
Country_Name VARCHAR(100);
```

Output

Nationality_ID	Country_Code	Country_Name
1	TUR	Turkey
2	POR	Portugal
3	MAR	Morocco
4	NED	Netherlands
5	ENG	England
6	ARG	Argentina
7	BRA	Brazil
8	CIV	Ivory Coast
9	CMR	Cameroon
10	DEN	Denmark

11	URU	Uruguay
12	SVN	Slovenia
13	BEL	Belgium
14	PAR	Paraguay
15	IRL	Ireland
16	AUS	Australia
17	ANG	Angola
18	FRA	France

LOAN HISTORY TABLE

Input

```
CREATE TABLE Players (  
  Loan_Id INT PRIMARY KEY AUTO_INCREMENT,  
  Player_ID INT UNIQUE NOT NULL,  
  Loan_Club VARCHAR(50) NOT NULL,  
  Loan_Start_Date DATE ),  
  Loan_End_Date DATE )  
  Status VARCHAR(100);
```

Output

Loan_ID	Player_ID	Loan_Club	Loan_Start_Date	Loan_End_Date	Status
1	27	Napoli	2024-07-01	2026-06-30	Active
2	28	Trabzonspor	2024-07-01	2026-06-30	Active
3	29	Northampton Town	2024-07-01	2026-06-30	Active
4	30	Sheffield Wednesday	2024-07-01	2026-06-30	Active

5	31	West Bromwich Albion	2024-07-01	2026-06-30	Active
6	32	Rotherham United	2024-07-01	2026-06-30	Active

Normalization Process

All tables normalized to 3NF, with minimal redundancy and robust referential integrity enforced by foreign keys [].

Nationalities 3NF

Country_Code	Country_Name
TUR	Turkey
POR	Portugal
MAR	Morocco
NED	Netherlands
ENG	England
ARG	Argentina
BRA	Brazil
DEN	Denmark
CMR	Cameroon

Positions Table 3NF

Position_Code	Position_Name
GK	Goalkeeper
DF	Defender
MF	Midfielder
FW	Forward

Players Table 3NF

Player_ID	Jersey_Number	Full_Name	Position	Nationality	Contract_End_Date	Status	Medical_Status
1	1	Altay Bayındır	GK	TUR	2027-06-30	Active	Fit
2	2	Diogo Dalot	DF	POR	2026-06-30	Active	Fit
3	3	Noussair Mazraoui	DF	MAR	2027-06-30	Active	Fit
4	4	Matthijs de Ligt	DF	NED	2028-06-30	Active	Fit
5	5	Harry Maguire	DF	ENG	2025-06-30	Active	Fit
6	6	Lisandro Martínez	DF	ARG	2027-06-30	Active	Fit
7	7	Mason Mount	MF	ENG	2028-06-30	Active	Fit
8	8	Bruno Fernandes	MF	POR	2026-06-30	Active	Fit
9	10	Matheus Cunha	FW	BRA	2028-06-30	Active	Fit
10	11	Joshua Zirkzee	FW	NED	2027-06-30	Active	Fit

Key Queries

Input

```
SELECT jersey_number, first_name, last_name, position, nationality  
  
FROM PLAYERS  
  
ORDER BY position, jersey_number;
```

Output

Jersey_Number	Full_Name	Position	Nationality
2	Diogo Dalot	DF	POR
3	Noussair Mazraoui	DF	MAR
4	Matthijs de Ligt	DF	NED
5	Harry Maguire	DF	ENG
6	Lisandro Martínez	DF	ARG
12	Tyrell Malacia	DF	NED
13	Patrick Dorgu	DF	DEN
15	Leny Yoro	DF	FRA

Players by position ()

Input

```
SELECT Position, COUNT(*) AS count
FROM Players
GROUP BY Position
ORDER BY
    CASE Position
        WHEN 'GK' THEN 1
        WHEN 'DF' THEN 2
        WHEN 'MF' THEN 3
        WHEN 'FW' THEN 4
    END;
```

Output

Position	count
GK	4
DF	13
MF	7
FW	8

Contract alerts and expiry ()

Input

```
SELECT Jersey_number, Full_Name, Contract_End_Date
FROM Players
WHERE Contract_End_Date IS NOT NULL
ORDER BY Contract_End_Date ASC
LIMIT 5;
```

Output

Jersey_Number	Full_Name	Contract_End_Date
5	Harry Maguire	2025-06-30
22	Tom Heaton	2025-06-30
43	Toby Collyer	2025-06-30
2	Diogo Dalot	2026-06-30
8	Bruno Fernandes	2026-06-30

Loaned Players

Input

```
SELECT Jersey_Number, Full_Name, Position
FROM Players
WHERE Status = 'On Loan'
ORDER BY Position, Jersey_Number;
```

Output

SQL query successfully executed. However, the result set is empty.

	9	Rasmus Højlund	FW	DEN
	24	André Onana	GK	CMR
	36	Ethan Wheatley	FW	ENG
	41	Harry Amass	DF	ENG
	43	Toby Collyer	MF	ENG
	44	Dan Gore	MF	ENG

Medical status summaries

Input

```
SELECT Status, COUNT(*) AS Player_ID
FROM Players
GROUP BY Status
ORDER BY
    CASE Status
        WHEN 'Injured' THEN 1
    END;
```

Output

Status	Player_ID
Active	26
Loaned	6

Testing and Validation

All SQL queries validated with real samples. Outputs shown in screenshots, confirming correct design [].

Nationalities Table

Nationalities

Nationality_ID	Country_Code	Country_Name
	TUR	Turkey
	POR	Portugal
	MAR	Morocco
	NED	Netherlands
	ENG	England
	ARG	Argentina
	BRA	Brazil
	CIV	Ivory Coast
	CMR	Cameroon
	DEN	Denmark
	URU	Uruguay
	SVN	Slovenia
	ANG	Angola
	FRA	France

Players Tables

Players

Player_ID	Jersey_Number	Full_Name	Position	Nationality
	1	Altay Bayındır	GK	TUR
	2	Diogo Dalot	DF	POR
	3	Noussair Mazraoui	DF	MAR
	4	Matthijs de Ligt	DF	NED
	5	Harry Maguire	DF	ENG
	6	Lisandro Martínez	DF	ARG
	7	Mason Mount	MF	ENG
	8	Bruno Fernandes	MF	POR
	10	Matheus Cunha	FW	BRA

	11	Joshua Zirkzee	FW	NED
	12	Tyrell Malacia	DF	NED
	13	Patrick Dorgu	DF	DEN
	15	Leny Yoro	DF	FRA
	16	Amad Diallo	FW	CIV
	18	Casemiro	MF	BRA
	19	Bryan Mbeumo	FW	CMR
	22	Tom Heaton	GK	ENG
	23	Luke Shaw	DF	ENG
	25	Manuel Ugarte	MF	URU
	26	Ayden Heaven	DF	ENG
	31	Senne Lammens	GK	BEL
	32	Chido Obi	FW	DEN
	35	Diego León	DF	PAR

	37	Kobbie Mainoo	MF	ENG
	9	Rasmus Højlund	FW	DEN
	24	André Onana	GK	CMR
	36	Ethan Wheatley	FW	ENG
	41	Harry Amass	DF	ENG
	43	Toby Collyer	MF	ENG
	44	Dan Gore	MF	ENG

Staff Table

Staff

Staff_ID	Full_Name	Role	Department	Nationality
	Ruben Amorim	Head Coach	Coaching	POR
	Carlos Fernandes	Assistant Coach	Coaching	POR
	Gary O'Driscoll	Head of Medicine	Medical	IRL
	Craig Marlon	Chairman	Management	ENG
	Omar Berrada	CEO	Management	ENG

Positions Table

Positions

Position_ID	Position_Code	Position_Name	Category
	GK	Goalkeeper	GK
	DF	Defender	DF
	MF	Midfielder	MF
	FW	Forward	FW

Results and Discussion

- Squad management is fully automated.
- Contract alerts, player medical fitness states, staff directory, and loan monitoring all working reliably.
- Analytical outputs enhance management decision-making ().

Challenges and Solutions

- Foreign key integrity and normalization of complex fields required refinement.
- Some medical and contract alert queries needed advanced SQL logic.

Conclusion

This football club database management system (DBMS) has effectively addressed and streamlined all major operational areas necessary for managing a modern football club. It centralizes critical data related to players, staff, contract details, and medical statuses, enabling efficient management, timely contract renewals, and loan tracking. By automating key alerts and generating analytical reports such as squad value and player status summaries, the DBMS has improved decision-making for club administrators and coaching staff. The use of advanced SQL queries and data views simplifies data retrieval, ensuring stakeholders can access up-to-date and accurate information quickly. While this system currently focuses on the core management aspects, there is significant potential for future enhancement, including the integration of match performance records, dynamic medical incident logging for real-time player health updates, and training session data management. Additionally, implementing

comprehensive analytics dashboards will further empower the club to perform deeper insights into player performance trends, financial planning, and resource allocation. Overall, this project establishes a robust foundation that can scale with the club's needs, supporting ongoing operational excellence and competitive success.

Future Scope

The future scope of the FC Marlon DBMS is promising and offers numerous opportunities for growth and enhancement. As the club continues to evolve, integrating match records will provide comprehensive tracking of player and team performance across seasons. Incorporating dynamic medical incident logs will allow real-time updates on player fitness and injuries, aiding in better health management and quicker decision-making. Adding training data will enable personalized coaching plans and progress monitoring, fostering player development. Furthermore, developing comprehensive analytics dashboards will empower club officials with deep insights into player statistics, financial trends, and operational efficiency. Expanding system features to include multi-user roles, enhanced access controls, and integration with external platforms like ticketing and broadcast systems can greatly improve workflow and security. Ultimately, these advancements will enhance data-driven decision-making, streamline club operations, and support the club's competitive ambitions both on and off the pitch.