INFO – 5707 Data Modeling for Information Professionals (Fall 2024)

Professor - Dr. Lingzi Hong

Project Group – 8

TERM PROJECT DESIGN PHASE

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Description of the objectives of your database system

Objectives

The main goal of the Pro Kabaddi League Database is to create and implement a comprehensive database system which is able to facilitate efficient management of kabaddi-related data. This system wants to enable the ease of team and player information, the management of match scheduling, fan engagement, sponsorship management, and statistical analysis. By doing this, the database that will ensure data accuracy, will help to make real-time decisions, and will provide insights into the performance of the players, team, and effect of the sponsors.

Additionally, the database will contribute to the overall convenience for all the parties such as fans, team managers, coaches, and sponsors through easy and fast access to the required data like player statistics, match results, and upcoming events. This mechanism, in addition, is going to create detailed reports on match outcomes, sponsorship performance, and ticket sales, that will be used for planning and evaluating the league.

The database will be an indispensable feature of:

Team and Player Management: Keeping a record of player details, team rosters, and player performance metrics to support the process of evaluations.

Match Organization: Setting up matches and monitoring the details of matches, including scores and results.

Fan Engagement: Storing fan records and tracking ticket sales to promote personalized interactions and improve engagement.

Sponsorship Tracking: Keeping the sponsorship agreements and contract details for cost control purposes.

Scope of the Project:

The main idea of the Pro Kabaddi League database is to hold, administer, and reveal commercial secrets; it is an organization for the administration of the parties, players, games, venues, fans, sponsors, and seasons. The database of the project counts the following areas:

Team Information Management: Gather and keep the details about each team, for example, team names, period of their establishment, home grounds, and coaching staff.

Player Data and Performance Tracking: Save all the possible pieces of information of each player as the name, date of birth, position, nationality, height, and weight, also include game statistics such as points scored and tackles made.

Match Scheduling and Results: Get all the instances of the matches of the past. Get the date of the matches, and the stadiums where they were played, as well as the team's positions, points, and final scores. Besides, make a system that tracks the status of the match.

Venue Details and Event Management: From the entire event, get the data about venues, for instance, the names, locations, if they are outdoor venues, if they are also for sports, type of venue used for organizing and managing events.

Fan Engagement and Personalization: The recording of the name, email, and support team of each fan is the only way to personalize the whole engagement through strategies and promotions.

Sponsorship Tracking and Financial Oversight: Manage the entire sponsorship process through maintaining all agreements including sponsor names, sponsorship amounts, and contract durations as well as ensuring that relationships with sponsors are not only effective but also managed properly.

Seasonal Data Archiving and Analysis: The organization can keep the data for the particular season exchanged between two parties, including season year, start and end dates, and total matches, to use historical analysis and performance tracking

User Requirements:

Data Management: A variety of data, such as team, player, match, and sponsorship information, are stored and managed in an orderly and effective manner with the help of the Pro Kabaddi League database. The entities like Teams, Players, matches etc structured in a way that it can store vast data and maintain relation among them so that can provide easier access to manage the operations from updating statistics on website into changing coaches based on the season's plugins with ease. Primary and foreign key constraints are used to enforce Data consistency, Business rules help in data entry avoidance redundancy, duplicate values exhaustive, data maintaining integrity.

Real-Time Updates: To get information rapidly and accurately, it has the capabilities of updating in real-time specifically when Match outcomes are considered as well as Player Statistics. The ability to get the most recent post-game match results and Updated player statistics.

Data Backup and Recovery: The System automatically creates and keeps secure backups of all important data, such as but not limited to Matches, Tickets, and Statistics, to guarantee the dependability of the information. The purpose of these backups is to avoid data loss and restore the latest version and state of information in the event of system failure. These backups are stored securely and encrypted such that they can only be restored in special procedures to restore the most recently modified valid information known as standby databases.

Reporting and Analytics: With this integration, Pro Kabaddi League (PKL) users be able to track and analyze team performance, player statistics, fan engagement information and financials to robust reporting capabilities. This provides data-driven insights on the statistics that happened through each match, such as number of points scored by a player or how many tackles they made in a game; and whether their team won the match. All these can be visualized to observe trends & identify areas for improvement Revenue generation from Sponsors & Ticket Sales data.

Access Control: The need for data integrity and security Access control mechanisms limits the exposure of user rights, and only authorized personnel can change important things like player statistics or sponsorship contracts. For different database operations, access levels are configured such that the coach can only view entities required by a league manager and vice versa. In addition, access control keeps out unauthorized changes to the Matches and Season entities providing database safety from mistakes and data tampering.

Historical Data: The database maintains historical information from each season held including players' performance, match statistics which allows long term trend analysis. It maintains an archive of previous team data; player performances and in-game statistics thereby enabling analysts to observe patterns season-over-season and predict outcomes wisely. It can help improve coaching tactics, player practices and league planning through historical knowledge used as deep insights to drive the decisions ahead.

Search and Filter Capabilities: It gives the ability to easily search and filter for all entities within a database. Searching for specific Players by team or position, Matches via date and stadium, and Tickets on a match with purchasedatetime. This ability helps in switching to related information on the go. In Statistics and Sponsorship, can have data populated only for certain seasons or match dates or financial amounts.

Compliance and Auditing: The database's layout is designed with compliance with data protection and privacy criteria in place. For example, Fan and Sponsorship data is stored following the Information Privacy Act, with a complete access log indicating who accessed the sensitive data with timestamp details. Regular audits are conducted to see if the system remains in line with the regulations, and the database's audit path is utilized to track modifications that might be made to entities like Sponsorship Contracts and Player Information.

Scalability and Security: The database is secured using certain security aspects like data encryption for sensitive information. This architecture will allow for dynamic additions of new entities future events or an ever-evolving set of fan engagement features without breaking existing data. For security purposes, follow regular data backups and transaction logs that would not only help keep your database reliable but also reduce the chances of losing any kind of information.

Integration: The system is meant to be linked with external applications, the integration involves real-time data sharing for fan engagement platforms, mobile apps and league websites. The integration allows for real-time match updates, player stats and ticket availability giving fans as well as the stakeholders a hassle-free experience. This data can be related to tickets and matches entities for online ticketing services while sponsorship & financial data is joined up into the leagues' finance management systems to aid in seamless reporting on finances including budget maintenance.

Business Rules

1. Each team is guided by one mandatory coach.

2. Each team can have multiple fans, and a fan can support one or more teams.

3. One team must have a fixed number of players.

4. Each player is assigned to only one team per season.

5. Each match must involve two different teams.

6. Multiple matches can be held in one venue.

7. Sponsors can sponsorship to multiple teams.

8. The Coach should have at least 5 years of experience.

9. A match can issue multiple tickets.

10. A fixed capacity is allocated to each venue.

11. A sponsor has a contract duration for the particular duration.

12. Each player should have information including nationality, height, DOB and weight.

13. Match must have information regarding Scores of A & B teams, Status, Season id.

14. There can be multiple matches in one season.

15. Each player can have multiple statistics.

Entity Relationship Diagram
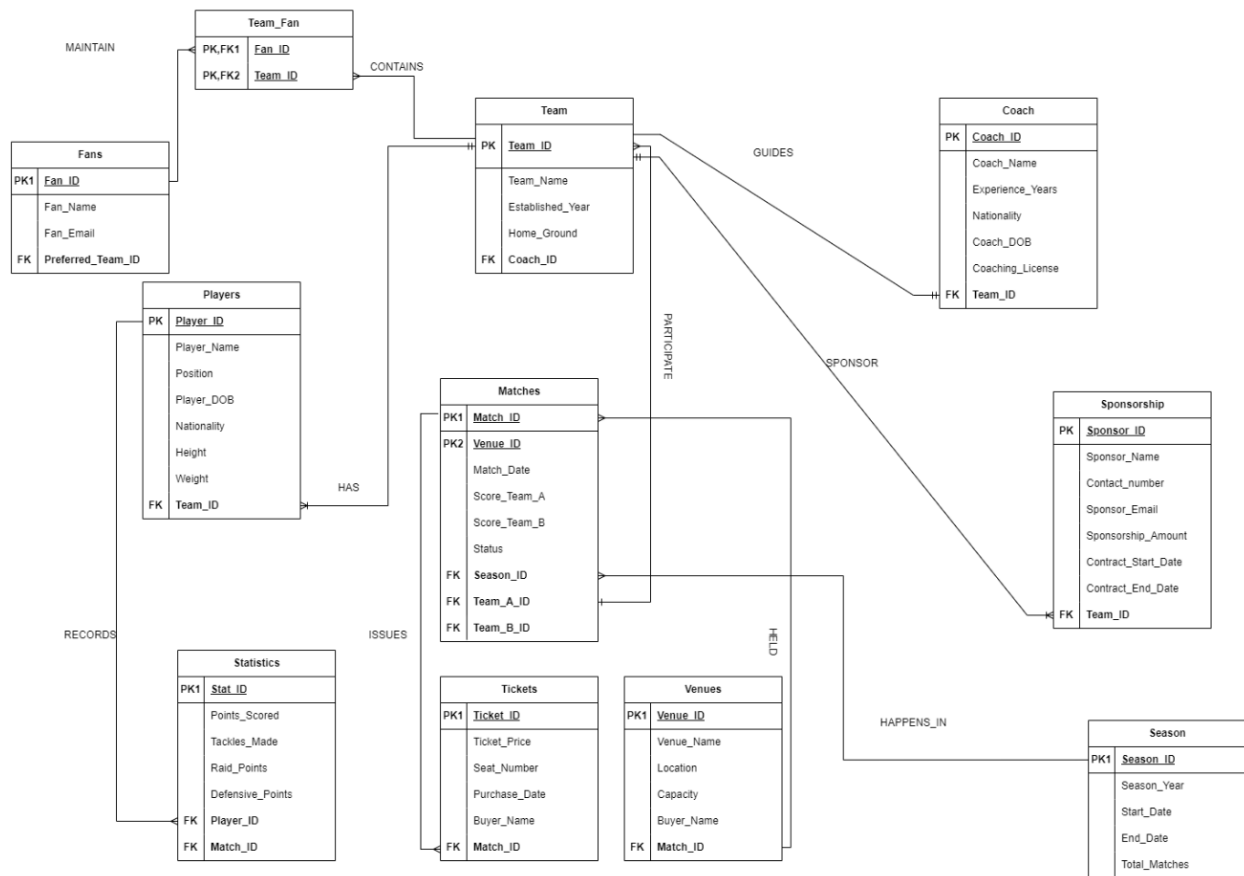
Link for Er diagram: Group_8_ER_Diagram_Link

DATA DICTIONARY:

Link for data dictionary Excel sheet: Group_8_Excel_Sheet_Link

***Note**: Including pictures as the table because the table was not able to fit inside the word file

	Entity	Attribute Name	Description	Type	PK/FK	Required	Referenced Table	Data Format	Example
1	**Entity**	**Attribute Name**	**Description**	**Type**	**PK/FK**	**Required**	**Referenced Table**	**Data Format**	**Example**
2	Team_Fan	Fan_ID	Unique fan identifier	Integer(10)	PK, FK	Yes	Fans	Integer	1001
3		Team_ID	Unique team identifier	Integer(10)	PK, FK	Yes	Team	Integer	101
4	Fans	Fan_ID	Unique fan identifier	Integer(10)	PK	Yes		Integer	1001
5		Fan_Name	Name of the fan	Varchar(50)		Yes		Text	John Doe
6		Fan_Email	Fan email address	Varchar(50)		Yes		Text	johndoe@email.com
7		Preferred_Team_ID	Fan's preferred team ID	Integer(10)	FK	No	Team	Integer	101
8	Team	Team_ID	Unique team identifier	Integer(10)	PK	Yes		Integer	101
9		Team_Name	Name of the team	Varchar(50)		Yes		Text	Warriors
10		Established_Year	Year of establishment	Integer(4)		No		Integer	2014
11		Home_Ground	Team's home stadium	Varchar(50)		No		Text	National Stadium
12		Coach_ID	Unique coach identifier	Integer(10)	FK	No	Coach	Integer	203
13	Players	Player_ID	Unique player identifier	Integer(10)	PK	Yes		Integer	301
14		Player_Name	Name of the player	Varchar(50)		Yes		Text	Amit Kumar
15		Position	Player's position	Varchar(20)		No		Text	Raider
16		Player_DOB	Date of birth of player	Date		No		Date	15/4/1995
17		Nationality	Player nationality	Varchar(30)		No		Text	Indian
18		Height	Height of player	Decimal(5,2)		No		Decimal	1.8
19		Weight	Weight of player	Decimal(5,2)		No		Decimal	75.5
20		Team_ID	Team affiliation	Integer(10)	FK	Yes	Team	Integer	101
21	Coach	Coach_ID	Unique coach identifier	Integer(10)	PK	Yes		Integer	203
22		Coach_Name	Name of the coach	Varchar(50)		Yes		Text	Rakesh Sharma
23		Experience_Years	Years of experience	Integer(3)		No		Integer	8
24		Nationality	Coach nationality	Varchar(30)		No		Text	Indian
25		Coach_DOB	Date of birth of coach	Date		No		Date	25/8/1980
26		Coaching_License	License number for coach	Varchar(20)		No		Text	LIC12345
27	Matches	Match_ID	Unique match identifier	Integer(10)	PK	Yes		Integer	501
28		Match_Date	Date of the match	Date		Yes		Date	21/6/2024
29		Score_Team_A	Score of team A	Integer(3)		No		Integer	42
30		Score_Team_B	Score of team B	Integer(3)		No		Integer	36
31		Status	Match status (e.g., Scheduled/Completed)	Varchar(20)		No		Text	Completed
32		Venue_ID	Venue identifier	Integer(10)	FK	Yes	Venues	Integer	601
33		Season_ID	Identifier of the season	Integer(10)	FK	Yes	Season	Integer	701
34		Team_A_ID	Identifier of team A	Integer(10)	FK	Yes	Team	Integer	101
35		Team_B_ID	Identifier of team B	Integer(10)	FK	Yes	Team	Integer	102
36	Statistics	Stat_ID	Unique stat identifier	Integer(10)	PK	Yes		Integer	801
37		Points_Scored	Total points scored	Integer(4)		Yes		Integer	18
38		Tackles_Made	Number of tackles	Integer(4)		Yes		Integer	5
39		Raid_Points	Raid points earned	Integer(4)		No		Integer	10
40		Defensive_Points	Defensive points earned	Integer(4)		No		Integer	8
41		Player_ID	Related player ID	Integer(10)	FK	Yes	Players	Integer	301
42		Match_ID	Related match ID	Integer(10)	FK	Yes	Matches	Integer	501
43	Venues	Venue_ID	Unique venue identifier	Integer(10)	PK	Yes		Integer	601
44		Venue_Name	Name of the venue	Varchar(50)		Yes		Text	Pro Stadium
45		Location	Location of venue	Varchar(50)		No		Text	Mumbai
46		Capacity	Seating capacity	Integer(5)		No		Integer	20000
47		Buyer_Name	Name of the buyer	Varchar(50)		No		Text	Anil Kapoor
48	Tickets	Ticket_ID	Unique ticket identifier	Integer(10)	PK	Yes		Integer	901
49		Ticket_Price	Price of the ticket	Decimal(10,2)		Yes		Decimal	1500
50		Seat_Number	Seat number	Varchar(10)		No		Text	A12
51		Purchase_Date	Date of ticket purchase	Date		Yes		Date	1/6/2024
52		Buyer_Name	Name of the ticket buyer	Varchar(50)		No		Text	Anil Kapoor
53		Match_ID	Related match ID	Integer(10)	FK	Yes	Matches	Integer	501
54	Sponsorship	Sponsor_ID	Unique sponsor identifier	Integer(10)	PK	Yes		Integer	1001
55		Sponsor_Name	Name of the sponsor	Varchar(50)		Yes		Text	XYZ Corp
56		Contact_number	Sponsor contact number	Varchar(15)		No		Text	911234567890
57		Sponsor_Email	Sponsor email address	Varchar(50)		No		Text	contact@xyzcorp.com
58		Sponsorship_Amount	Amount sponsored	Decimal(10,2)		Yes		Decimal	500000
59		Contract_Start_Date	Contract start date	Date		No		Date	1/1/2024
60		Contract_End_Date	Contract end date	Date		No		Date	31/12/2024
61		Team_ID	Team being sponsored	Integer(10)	FK	Yes	Team	Integer	101
62	Season	Season_ID	Unique season identifier	Integer(10)	PK	Yes		Integer	701
63		Season_Year	Year of the season	Integer(4)		Yes		Integer	2024
64		Start_Date	Start date of the season	Date		Yes		Date	15/1/2024
65		End_Date	End date of the season	Date		Yes		Date	15/3/2024
66		Total_Matches	Number of matches	Integer(4)		Yes		Integer	60