Phase 1

IPL FANTASY LEAGUE

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I. Introduction:

The Indian Premier League is one of the most loved friendly match series that draws the interest of the masses. It is often identified as the biggest annual cricketing festival in India. The **IPL Fantasy League** (https://fantasy.iplt20.com/) has been introduced to provide unmatched entertainment to hardcore cricket fans of India. IPL Fantasy League is a platform where cricketing pundits and cricket fans make their own IPL predictions and be part of the ongoing auction for a chance to win huge cash prizes and vouchers. It is a virtual gaming platform where the participants act as managers and create their own teams with virtual currency during the IPL auction. Teams must consist of players between 18 and 25 in number, with a maximum of 8 overseas players. The IPL players are assigned some virtual value based on which a user must create a team by choosing players. The league is composed of 10 teams which are divided into two groups of five teams each. In the group stage, each team plays 14 games, facing the other four teams in their group two times each (one at the home stadium and one away), four teams in the other group once, and the remaining team two times over a period of 9 weeks.

II. Purpose Of the Database:

The database allows the administrators to maintain and manage the database and control access to the data. It stores details of managers, franchise owners, teams, players, fixtures and other relevant information. In the present phase of the project where we enlist the data requirements, we show how entities and functions are organized meaningfully to achieve a set of objectives. It helps reflect the occurrences of real time matches in the teams' score and keep the real and virtual world in sync.

III. Users Of the Database:

1. **Regulatory Department:**
   These **parametric** end users possess administrator privileges who formulate and control the structure of the league. They serve as a connecting link between the Indian Premier League and the IPL Fantasy League by regulating the flow of real time data into the database.
2. **IT Department:**
   These **sophisticated** end users write application programs to translate the data in the database into various platforms for appropriate use. They handle management of the website, app interface and their proper functioning, so that correct statistics are reflected appropriately whenever and wherever required. They also deal with maintenance of the database.
3. **Scoring Department:**
   These users develop a fixed system to convert real-time performances of players into points. They take on and off paper contributions of players as inputs to generate points which are then fed back into the database.
4. **Accounting Department:**
   These users manage the finance and related aspects of the league. They manage financial transactions with the sponsors for the event throughout multiple editions of the event and keep track of rewards to be presented to top players.
5. **Public Relations (PR) Department:**
   These users supervise and assess public attitudes and maintain mutual relations and understanding between the league organization and the audience. They improve channels of communication through advertising on various platforms such as social media, television and online streaming services, and institute new ways of setting up a two-way flow of information and understanding. They also disseminate important league events, maintain brand image and provide regular updates on various platforms.
6. **Participants:**
   These **casual-end** users would require the database to track the performance of their team and its position/net run rate in the points table in various categories. They would also need to refer to player and fixture statistics in order to come up with strategies to maximize points in upcoming game weeks.
7. **Cricket Enthusiasts and Bookies:**
   These **stand-alone** users track data pertaining to the result of matches and performance of the players.

IV. *Applications:*

The designed database helps the IPL Fantasy League administrators and organizers manage, store, and retrieve data ranging from the details of the players to the participants, and establish meaningful connections between varied data. For instance, the database could enable one to:

1. Calculate the Fantasy points a player has contributed to a team over the course of the tournament.
2. Track Fair-Play reward points awarded to a team during the tournament.
3. Find the Most Valuable Player (MVP) of the tournament.
4. Know the sponsors/presenters of the present tournament edition.
5. View the remaining number of boosters the participant is yet to use.
6. Track the Orange/Purple cap holders of the present edition of the tournament.
7. View the players nominated for the Emerging Player Award of the tournament.
8. Obtain the list of the players who won the Man-of-the-Match award across all the fixtures in the tournament.

V. Database Requirements:

1. Strong Entity Types:

Entity Type	Attribute	Attribute Type	Sub-attribute	Data Type
TEAM	Name	Key	-	VARCHAR (30)
	Place	Simple	-	VARCHAR(20)
	Manager	Composite Key	First_name	VARCHAR(20)
			Last_name	VARCHAR(20)
	Money_left	Simple	-	INT
	RTM_Cards	Simple	-	INT
	Total_points	Simple	-	INT
	Brand_value	Simple	-	INT
	Coach	Simple	-	VARCHAR(20)
	Fair_play_points	Simple	-	DECIMAL(5,2)
LEAGUE	Name	Simple	-	VARCHAR(30)
	Season_Number	Key	-	INT
	Winner	Simple	-	VARCHAR(20)
	Runner_Up	Simple	-	VARCHAR(20)
	Prize_Money	Simple	-	INT
FIXTURE	Date_Time_Venue	Composite Key	Date_Time	TIMESTAMP
			Venue	VARCHAR(50)

	Match_No	Partial Key	-	INT
	Commentators	Multi-valued	Name	VARCHAR(30)
	Umpire	Multi-valued Composite	Name	VARCHAR(20)
			Position	INT
	Result	Simple	-	VARCHAR(30)
PARTNER	Name	Key	-	VARCHAR(50)
	Type	Multi-valued	-	VARCHAR(40)
	CIN	Key	-	INT
PLAYER	Name	Composite Key	First_name	VARCHAR(20)
			Last_name	VARCHAR(20)
	Auctioned_Price	Simple	-	INT
	Base_Price	Simple	-	INT
	Fantasy_Points	Simple	-	INT
	Form	Derived	-	DECIMAL (3, 1)
Subclasses of Player (4)				
a. BATSMAN	Runs	Simple	-	INT
	Strike_Rate	Simple	-	DECIMAL (5, 2)
	Average	Simple	-	DECIMAL (5, 2)
b. BOWLER	Wickets	Simple	-	INT
	Economy	Simple	-	DECIMAL (5, 2)
	Average	Simple	-	DECIMAL (5, 2)
c. WICKET_KEEPER	Stump_outs	Simple	-	INT
	Catches	Simple	-	INT
d. FIELDER	Runs_saved	Simple	-	INT
	Catches	Simple	-	INT
	Run_outs	Simple	-	INT

2. Weak Entity Types:

Entity Type	Attribute	Attribute Type	Sub-attribute	Data Type
JERSEY	Jersey_Number	Partial Key	-	INT
AWARDS	Name	Partial Key	-	VARCHAR (20)
	Prize_Money	Simple	-	INT

3. Relationship Types:

Relationship Type	Degree	Entities		Cardinality	Participation Constraints	
		Entity 1	Entity 2		E1	E2

PLAYS_IN	2	TEAM	FIXTURE	2:N	(1, N)	(2, 2)
SPONSORS_LEAGUE	2	PARTNER	LEAGUE	M:N	(0, N)	(0, M)
SPONSORS_TEAM	2	PARTNER	TEAM	M:N	(0, N)	(0, M)
SPONSORS_PLAYER	2	PARTNER	PLAYER	M:N	(0, N)	(0, M)
LEADS	2	PLAYER (Captain)	PLAYER (Normal)	1: N	(1, N)	(1, 1)
BELONGS_TO	2	JERSEY	TEAM	N:1	(1, 1)	(1, N)
OF	2	FIXTURE	LEAGUE	N:1	(1, 1)	(1, N)

Ternary								
Relationship Type	**Degree**	**Entities**			**Cardinality**	**Participation Constraints**		
		Entity 1	**Entity 2**	**Entity 3**		**E1**	**E2**	**E3**
AWARDED_IN...TO	3	AWARD	LEAGUE	PLAYER	P:Q:R	(1, P)	(1, Q)	(0, R)
PLAYS_FOR...IN	3	PLAYER	TEAM	LEAGUE	P:Q:R	(1, P)	(15, Q)	(1, R)

Quaternary									
Relationship Type	**Degree**	**Entities**				**Cardinality**	**Participation Constraints**			
		E1	**E2**	**E3**	**E4**		**E1**	**E2**	**E3**	**E4**
PLAYS_FOR...IN...OF	4	PLAYER	TEAM	FIXTURE	LEAGUE	P:Q:30:R	(1, P)	(1, Q)	(30, 30)	(1, R)

-> Identifying Relationships
-> Bonus Relationship

VI. *Functional Requirements:*

The contents of the database are accessible to each end user unless they are obtainable only through those query types that are of type [ADMIN], in which case, it can be accessed only by the administrators who are part of the regulatory, IT, accounting, scoring and the PR departments in this case.

1. Modifications:

a. Insert [ADMIN]:

A query function to insert an entity under a particular entity-type. If an insert operation violates Domain/Key/Referential/Integrity constraints the insertion is rejected by providing a reason to the user as to why the insertion was rejected.

i. ***insert_fixture:***

Insert an upcoming fixture under FIXTURE in the database

ii. ***insert_player:***
Insert a new player entry under PLAYER in the database

b. **Delete [ADMIN]:**
A query function to delete an entity under a particular entity-type

i. ***delete_player:***
Delete a player from PLAYER if the player transfers out of the league

ii. ***delete_partner:***
Delete a partner from PARTNER if the partner chooses to end the contract

c. **Update [ADMIN]:**
A query function to update the attributes of an entity

i. ***deduct_fair_points:***
Deduct fair_play_points associated with a team in case of violation of the code of conduct

ii. ***update_team_points:***
Update total_points associated with teams after every fixture

2. Retrievals:

a. **Search:**
Search (partial text match) for entries in an entity, matching for subparts of the entries.

i. ***search_player:***
Search for a player by Name in the PLAYER table of the database

ii. ***search_fixture:***
Search for a fixture by Date_time in FIXTURE table of the database

b. **Sorting:**
Query function to sort selected entities belonging to an entity type

i. ***sort_by_team_points:***
Sorts the list of teams in the database in decreasing order of total_points

ii. ***sort_by_player_name:***
Sorts the list of players in the database in lexicographical order of their names.

c. **Selection:**
Query function to retrieve complete data tuples belonging to an entity type

i. ***retrieve_partners:***
retrieve data corresponding to all partners associated with the tournament.

d. **Aggregate:**
Set of query functions useful in many computations and statistical analysis like MIN, MAX, SUM, AVG, MEAN, MODE, MEDIAN, and so on

i. ***get_orange_cap_awardee:***
Find the player who scored the most runs in the tournament

ii. ***get_purple_cap_awardee:***
Find the player who took the most wickets in the tournament

iii. ***get_best_batsman:***
Find the player with the highest strike rate

iv. ***get_best_bowler:***
Find the player with the least economy rate

e. **Projection*:***
Query function to search the database by a particular set of attributes

i. ***get_slog_over_batsmen:***
retrieves list of batsmen with strikerate more than 180 in the tournament

ii. ***get_death_over_bowlers:***
retrieves list of bowlers with economy less than 9 in the tournament

f. **Analysis [ADMIN]:**
Query function to generate reports for analysis required for statistical, accounting, financial and marketing purposes

i. **get_tournament_report*:***
Display results of all the fixtures held in a particular league

ii. ***get_pitch_dependency_report:***
Display the list of teams that have won in more than 70% of the fixtures when playing in home-city.

VII. *Summary:*

Our database allows end users of the application to choose players and form their own team that are associated with Fantasy points calculated by the administration department, which also manages accounting and marketing. It helps in keeping track of the users and allows the application administration to pick rewardees from them.