



Sri Lanka Institute of Information Technology

Assignment 2

IT3021 - Data Warehousing and Business Intelligence

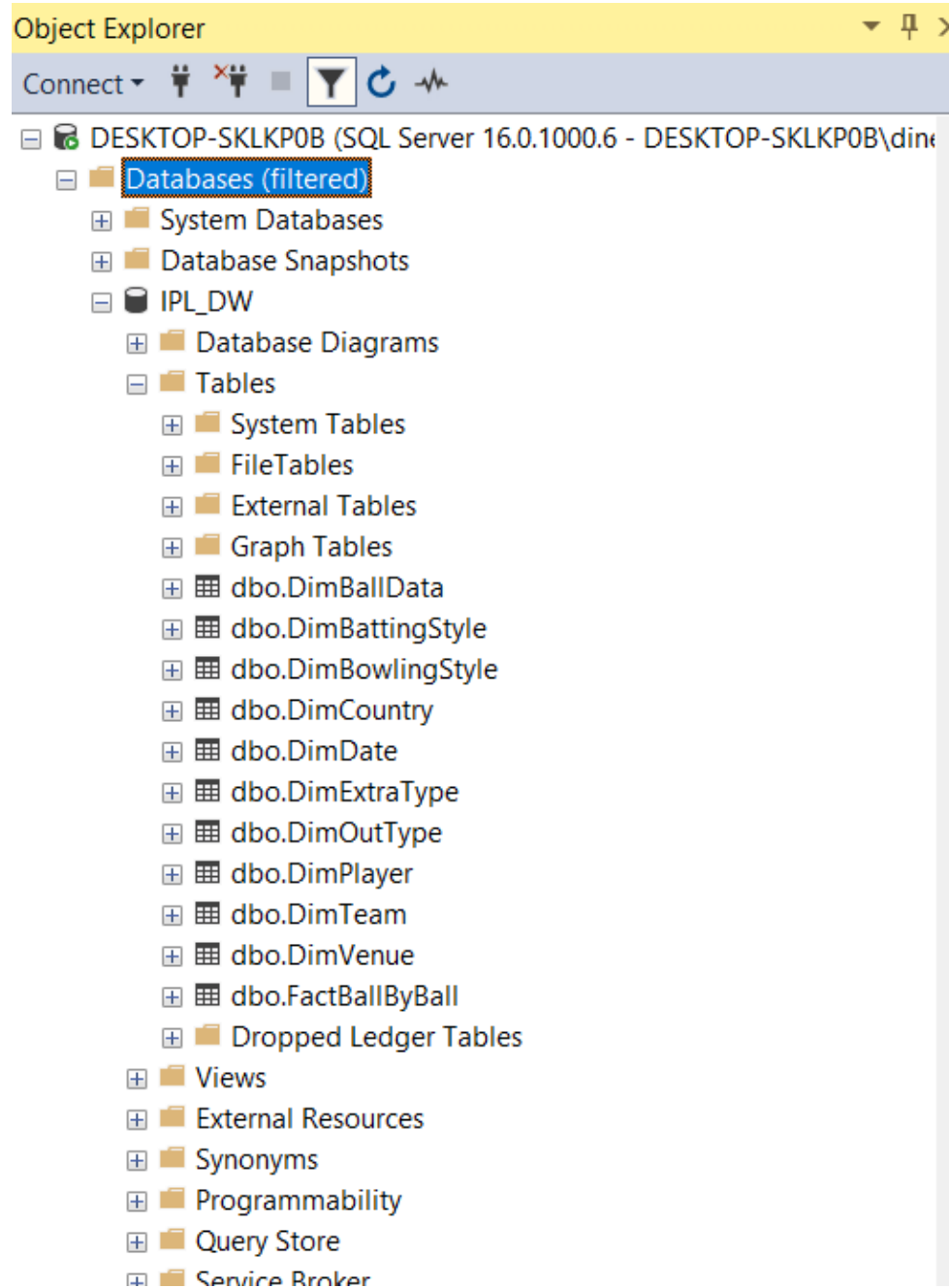
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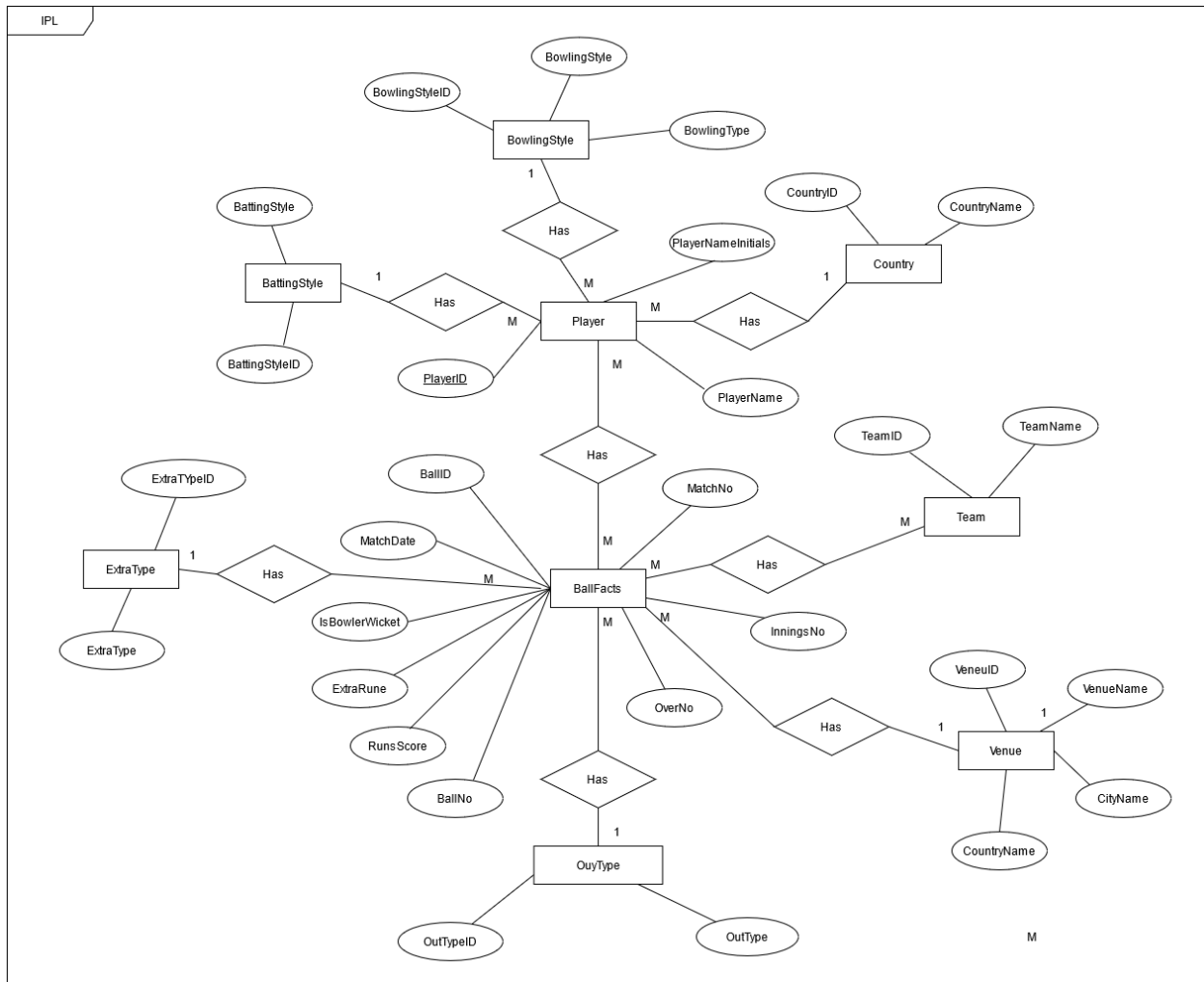
Data source for the assignment

I used data warehouse database (IPL_DW) as the data source which I created in Assignment 1. It consists of a snowflake schema and consists of ten dimensions and fact table.

Given below are the dimensions and facts of the data source;



ER diagram



SSAS Cube implementation

Following tools were used in creating the SSAS cube;

SSAS

SQL Server Management Studio

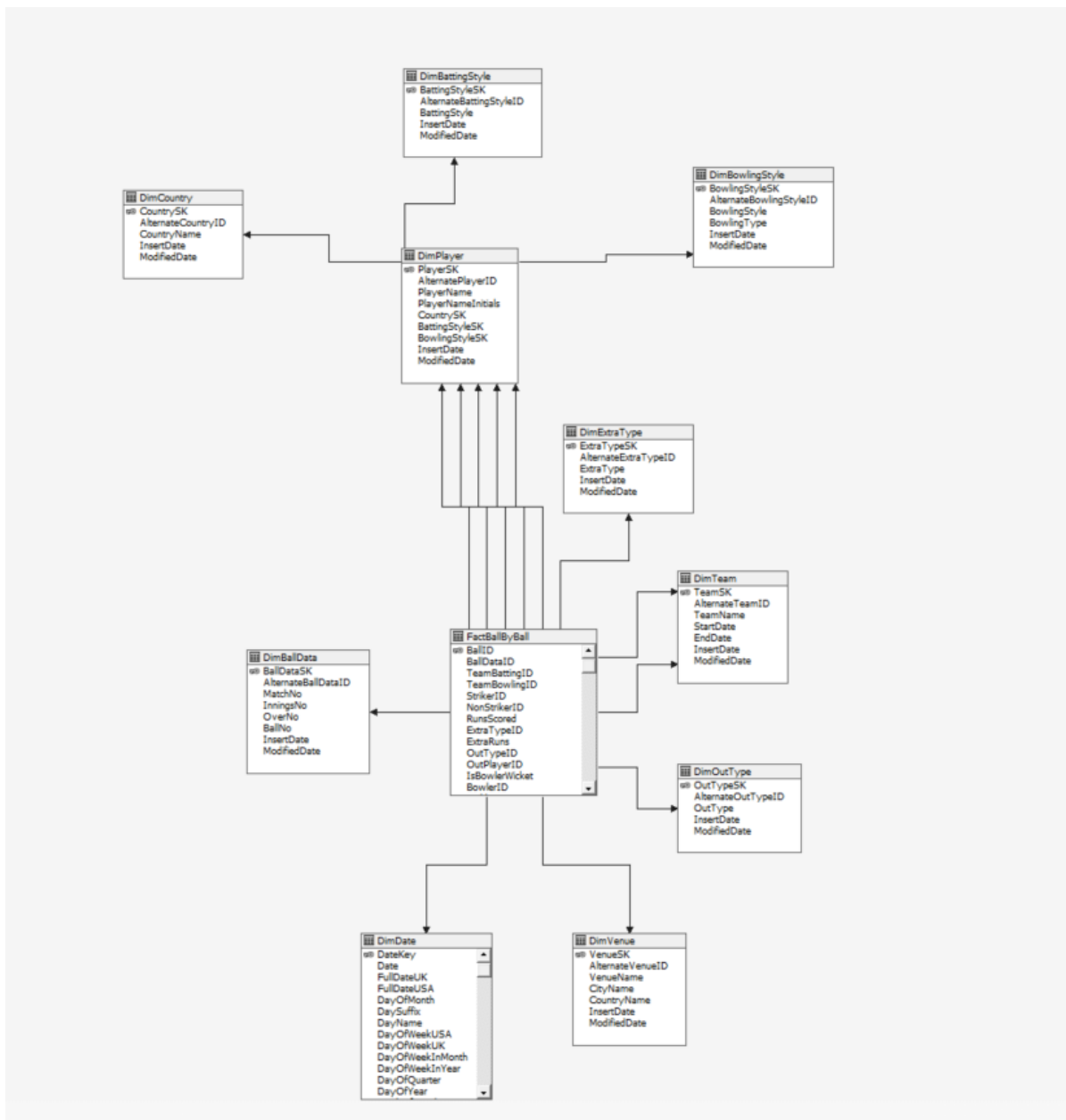
SSDT

Create a Data source

First data source was created in order to get data for the cube

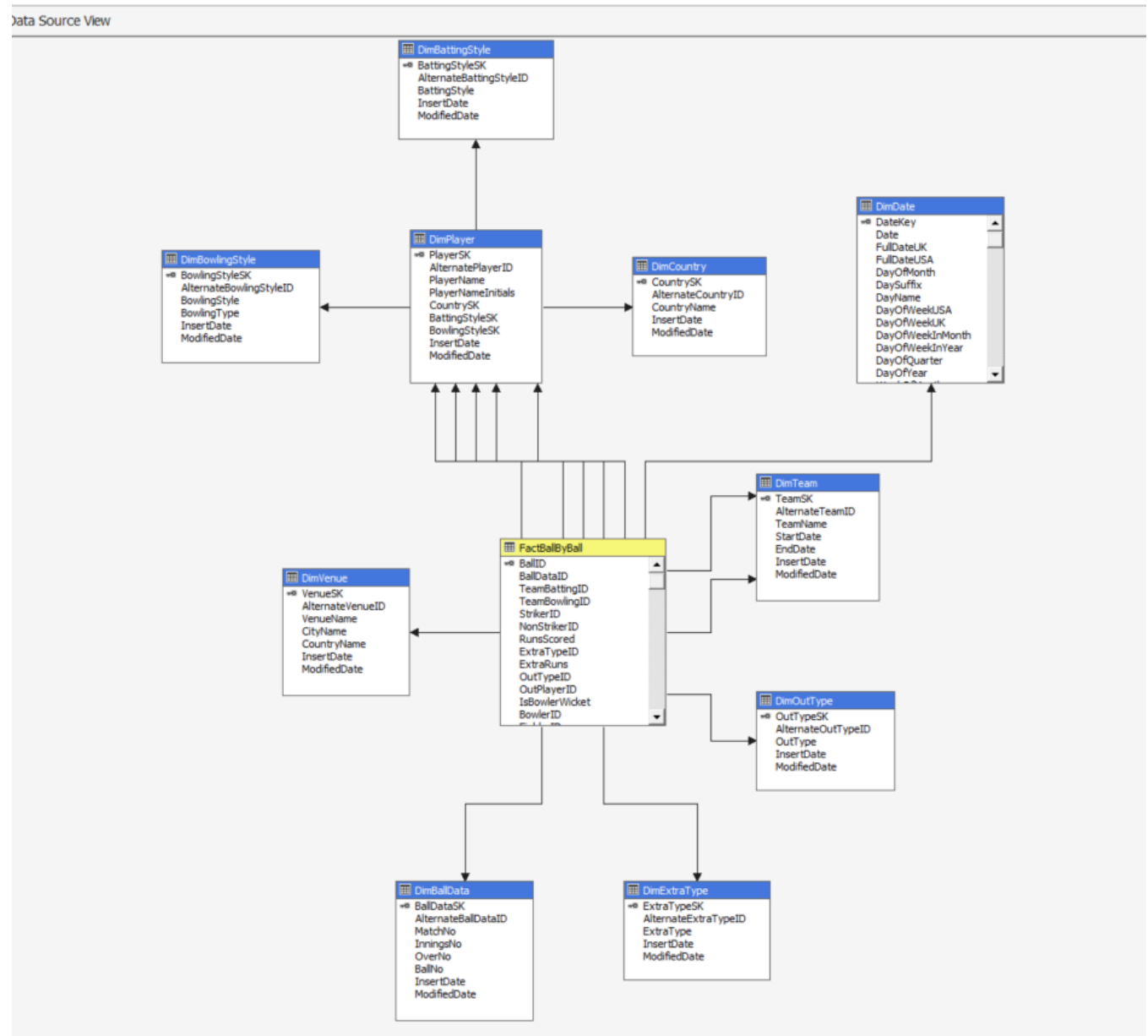
Create a Data Source View

As second step data source view was created as DSV_IPL_DW



Create the Cube

As the third step SSAS cube was created



Deploy the Cube

Next the attributes were added to the dimensions and deployed the cube.

The screenshot displays the SQL Server Data Tools (SSDT) interface. The top menu bar includes options like 'Cube Structure', 'Dimension Usage', 'Calculations', 'KPIs', 'Actions', 'Partitions', 'Aggregations', 'Perspectives', 'Translations', and 'Browser'. The left pane shows the 'Measures' and 'Dimensions' sections. The 'Measures' section lists 'Cube_IPL' and 'Fact Ball By Ball'. The 'Dimensions' section lists 'Cube_IPL', 'Bowler', 'Fielder', 'Team Batting', 'Out Player', 'Team Bowling', 'Non Striker', and 'Striker'. The main area shows a 'Data Source View' diagram with four dimensions: 'DimBattingStyle', 'DimPlayer', 'DimBowlingStyle', and 'DimExtraType'. The 'DimPlayer' dimension is the central hub, connected to the other three. Below the diagram, the 'Deployment Progress - IPL-SSAS-IT20183554' window is open, showing the following command log:

```
Command
Command
Processing Database 'IPL-SSAS-IT20183554' completed.
  Start time: 5/16/2022 5:33:48 PM; End time: 5/16/2022 5:33:48 PM; Duration: 0:00:00
Processing Cube 'Cube_IPL' completed.
  Start time: 5/16/2022 5:33:48 PM; End time: 5/16/2022 5:33:48 PM; Duration: 0:00:00
Processing Measure Group 'Fact Ball By Ball' completed.
```

At the bottom, a green checkmark icon and the text 'Deployment Completed Successfully' indicate the successful completion of the deployment process.

Create KPI

Next a KPI was created to get the players who have scored more than 30.

The screenshot shows the 'KPI Organizer' window in SQL Server Data Tools. The 'KPI Runs' KPI is selected in the left pane. The right pane shows the configuration details:

- Name:** KPI Runs
- Associated measure group:** Fact Ball By Ball
- Value Expression:** [Measures].[Runs Scored]
- Goal Expression:** [Measures].[Runs Scored] > 30
- Status:** Status indicator: Gauge
- Trend:** Trend indicator: Status arrow

The 'Calculation Tools' pane on the left shows the 'Measure Group' dropdown set to '<All>' and a list of available measures including 'Runs Scored'.

Browse Cube Data

The screenshot shows the 'Cube_IPL [Browse]' window in SQL Server Data Tools. The 'Player Name' dimension is selected, and the data is displayed in a table format.

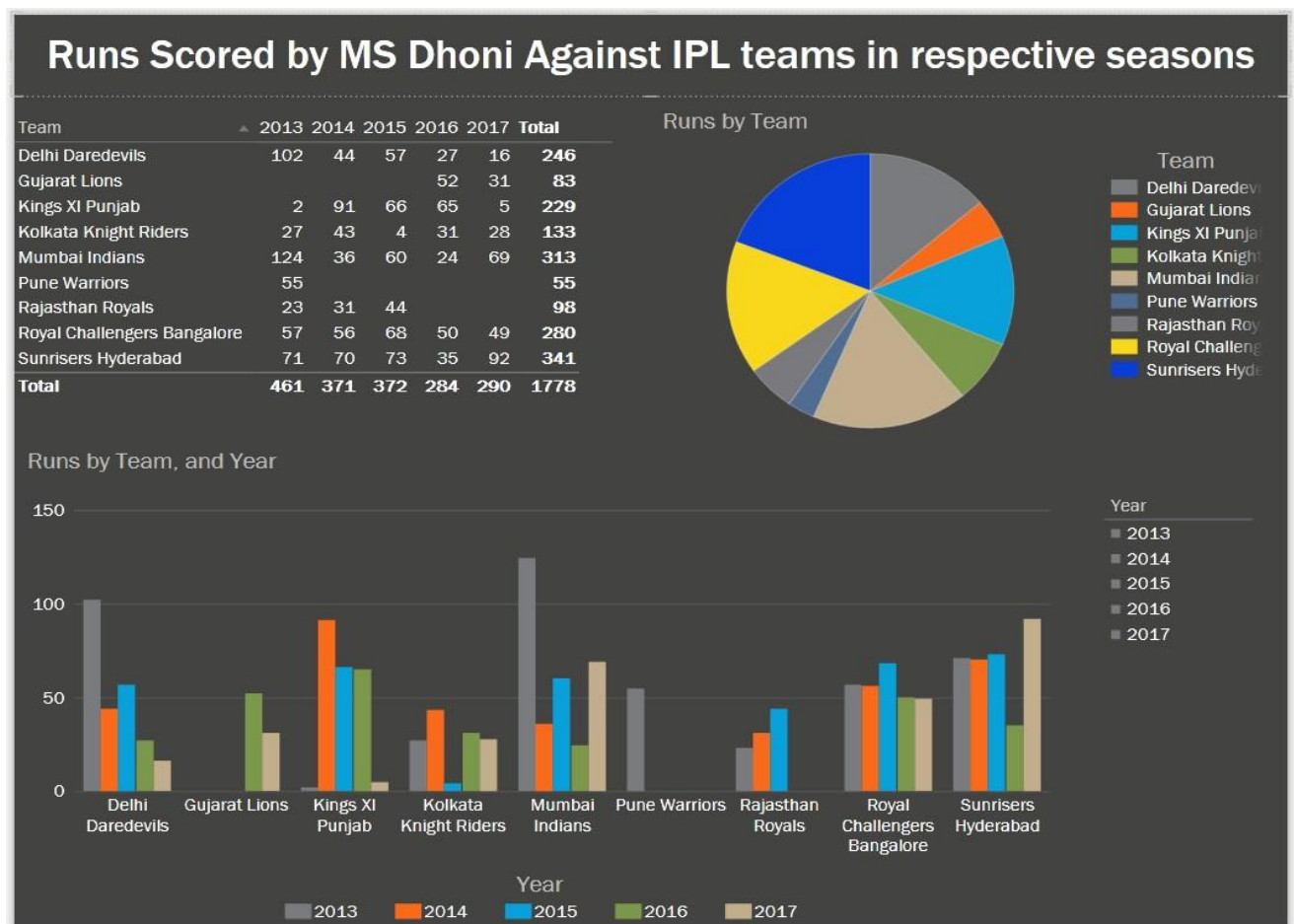
Player Name	Player Name Initials	Is Bowler	Wicket
Aaron	VR	2	
Abbott	KJ	1	
Abbott	SA	1	
Abdulla	Iqbal	1	
Agarkar	AB	1	
Agarwal	MA	28	
Ahmed	AN	1	
Al Hasan	Shakib	13	
Amia	HM	12	
Anderson	CJ	16	
Anirudha	S	2	
Aravind	S	3	
Arun Karthik	KB	2	
Ashish Reddy	A	9	
Ashwin	M	1	
Ashwin	R	11	
Awana	P	2	
Baby	Sachin	7	
Badree	S	5	
Badrinath	S	7	
Bailey	GJ	22	
Balaji	L	2	
Bawne	AR	0	
Behardien	F	2	
Bhatia	R	13	

Demonstration of OLAP operations

Slice

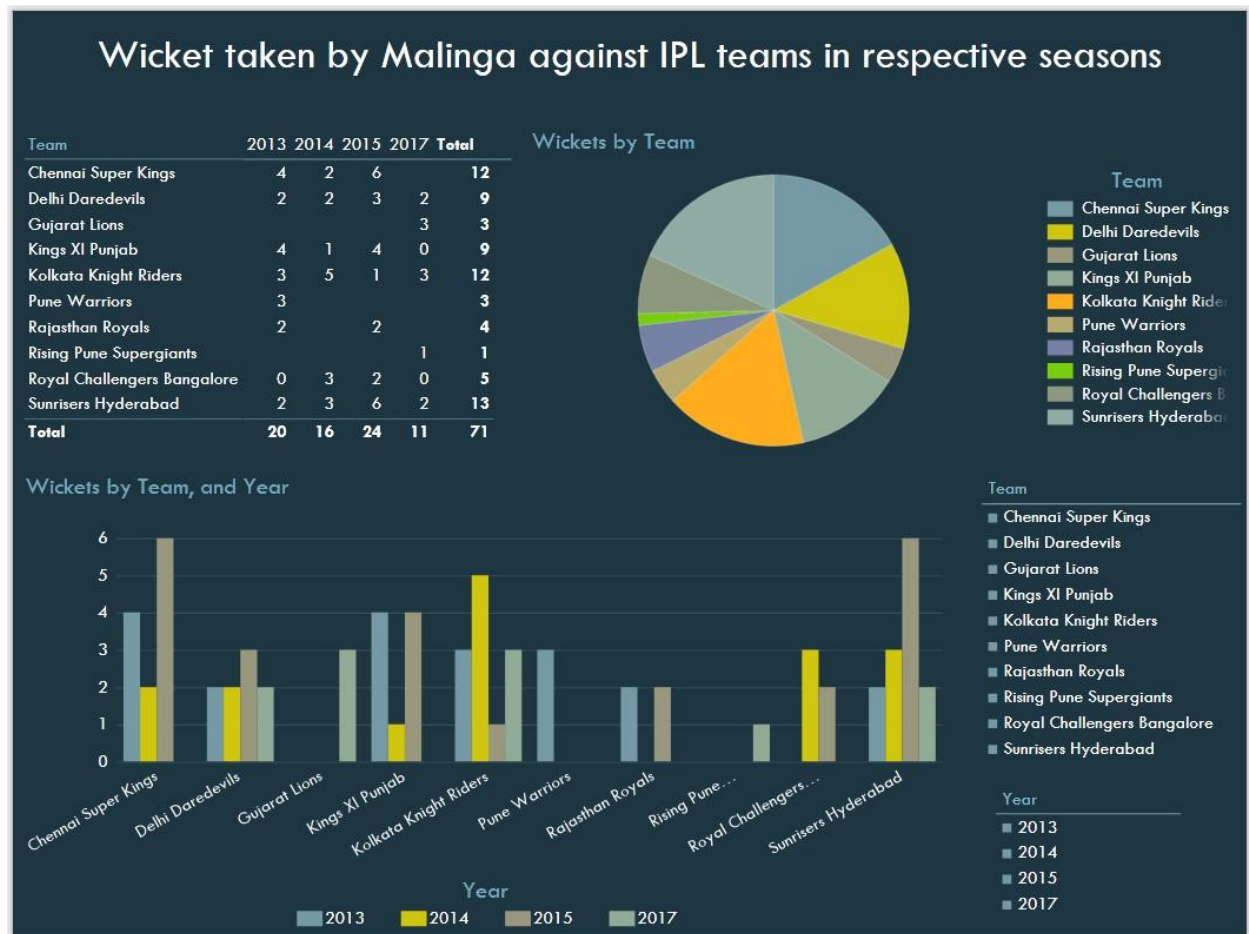
Runs scored by Dhoni against IPL teams is show by the below table and charts. We can slice the data according to the season/year using the year slicer.

Note – In any of these table null values are not set to zero because having null values doesn't mean the player hasn't scored runs or wickets, it means that he has not played that ball, over or match.



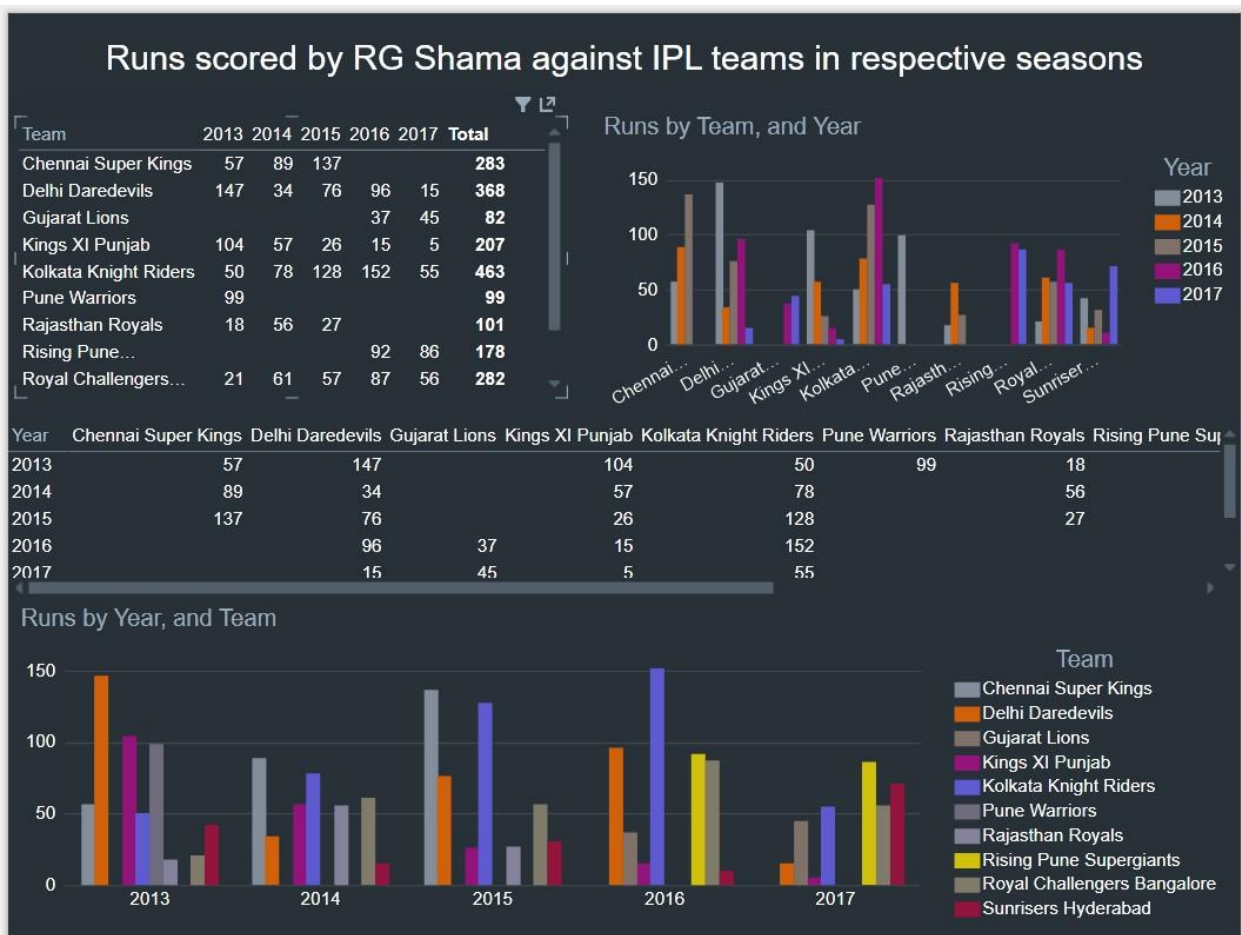
Dice

Wickets taken by Malinga against IPL teams is shown by the below table and graphs. We can dice the data according to the season/year and team using the year slicer and team slicer.



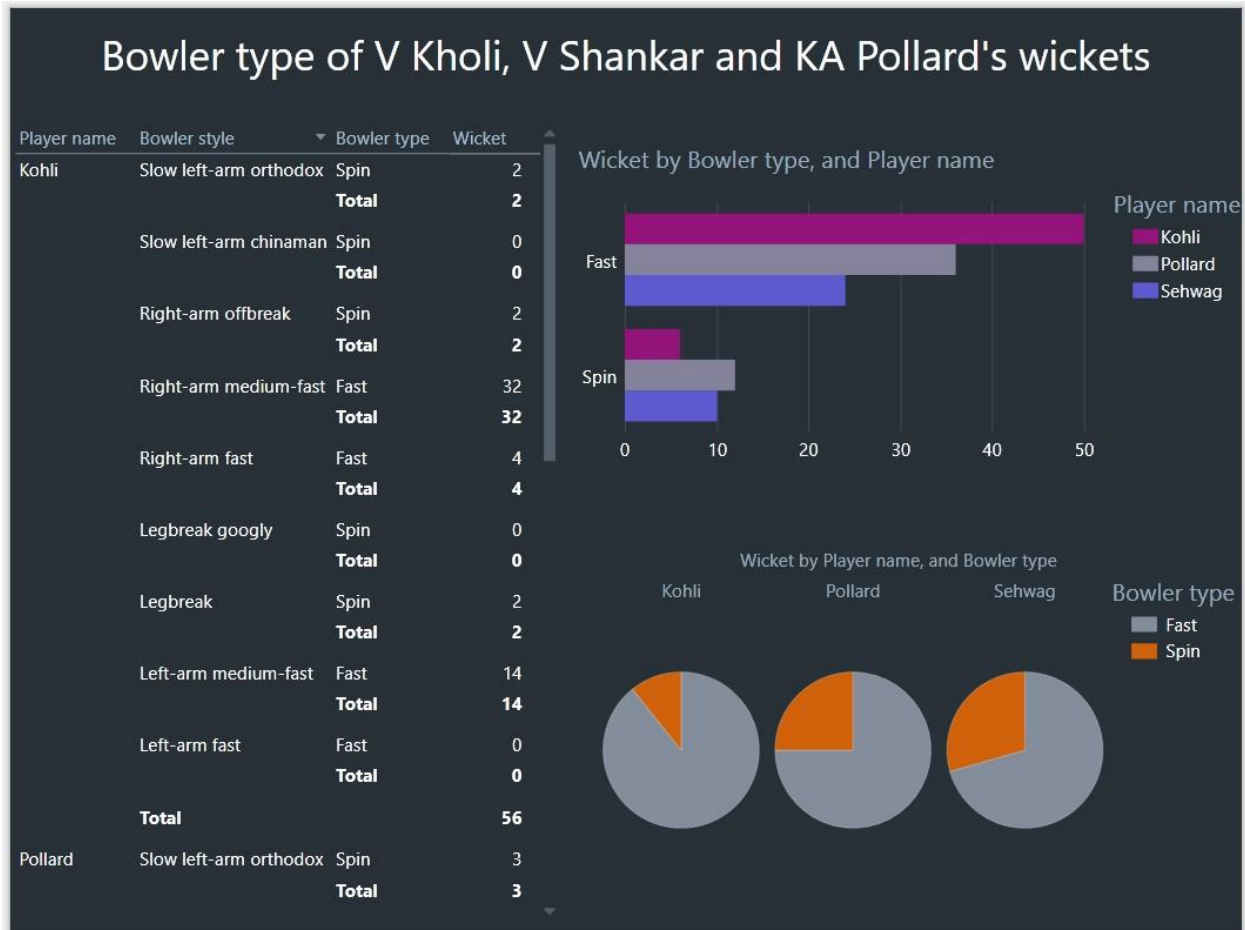
Pivot

Runs scored by Sharma against IPL teams is show by the below table and charts. The pivot table and chart using team and year is show in bottom diagrams.



Roll-up

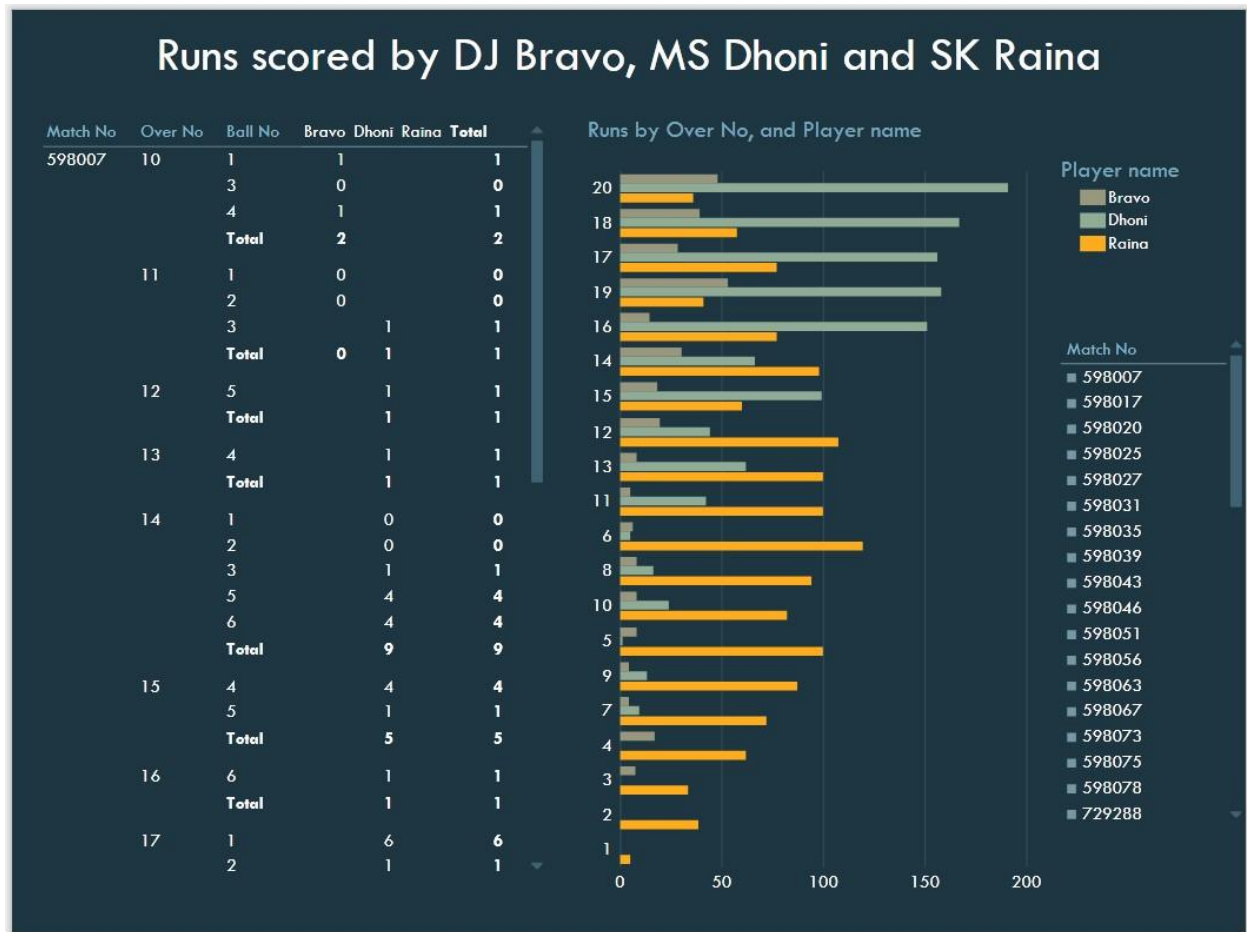
Bowler type of Kohli, Shankar, pollard's wickets is show by the below table and charts. We can roll-up by bowler style and bowler type.



Drill-Down

Runs scored by Bravo, Dhoni, Raina is show by the below table and charts.

We can Drill-Down by Match number, over number and ball number..



PowerBI Reports

Report1: Report with a matrix

The screenshot shows a PowerBI report titled "Ball Counts by Player and Day of Week". The report is displayed in a matrix format. The rows represent players, and the columns represent the days of the week (Friday, Monday, Saturday, Sunday, Thursday, Tuesday, Wednesday) and a Total column. The data is as follows:

PlayerName	Friday	Monday	Saturday	Sunday	Thursday	Tuesday	Wednesday	Total
Aaron	51	116	143	155	59	53	58	635
Abbott		14	54	25		20	21	134
Abdulla	62	75	21	117	24	61	75	435
Agarkar				19	26	18		63
Agarwal				24				24
Ahmed		27	48	49	24	59		207
Al Hasan	42	52	117	105	74	98	116	604
Anderson	35	14	50	50	22	18	70	259
Aravind	61	52	42	146	20	43	118	482
Ashish Reddy	12	6	37	18	11	17		101
Ashwin	234	88	289	252	218	234	112	1427
Awana	45	50	48	150	76	97	12	478
Baby			4				6	10
Badree	43		92	85	18	25		263
Balaji	95	24	68	122	46	71	96	522
Baroka				21				21
Bhatia	96	60	97	158	131	135	102	779
Bhatt	19					12		31
Binny	75	56	86	84	24	48	90	463
Boland				19	24			43
Bopara		19	56		42		6	123
Botha	18	25	31		6	37	47	164
Boult	51	80	125	24	50		25	355
Brathwaite	49		51	44	12		25	181
Bravo	125	98	228	227	162	131	93	1064
Bumrah	80	155	227	247	146	48	180	1083
Cariappa	51	43	56	42			19	211
Chahal	123	194	189	307	92	147	167	1219
Chahar	18		61		12	32		123
Chandila		42	42	30	24		12	150
Total	9633	7993	13979	15197	8423	9138	9721	74084

- Data Preparation

I connected Power BI Desktop to the cube where ball counts, player names, and days of the week were available.

- Modeling

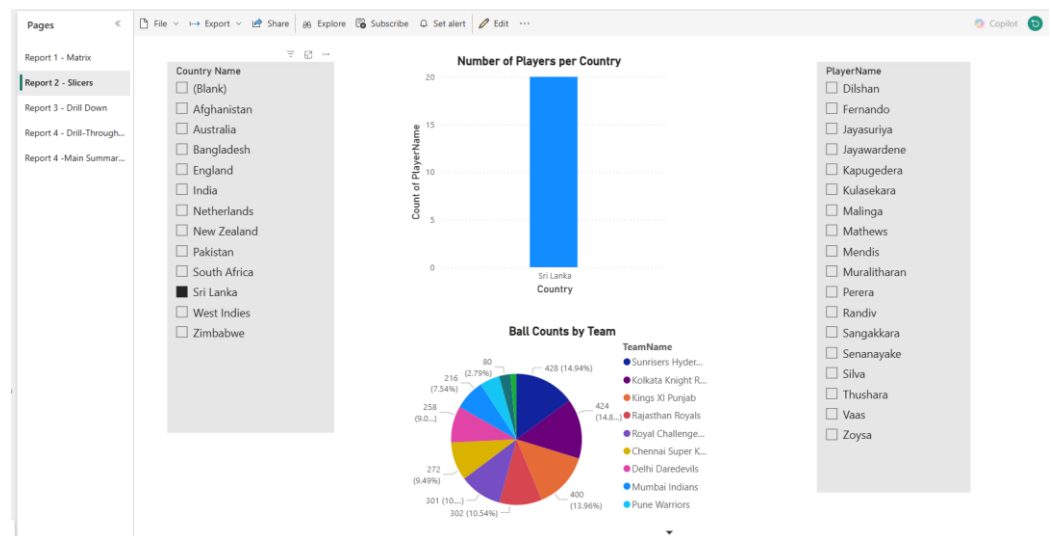
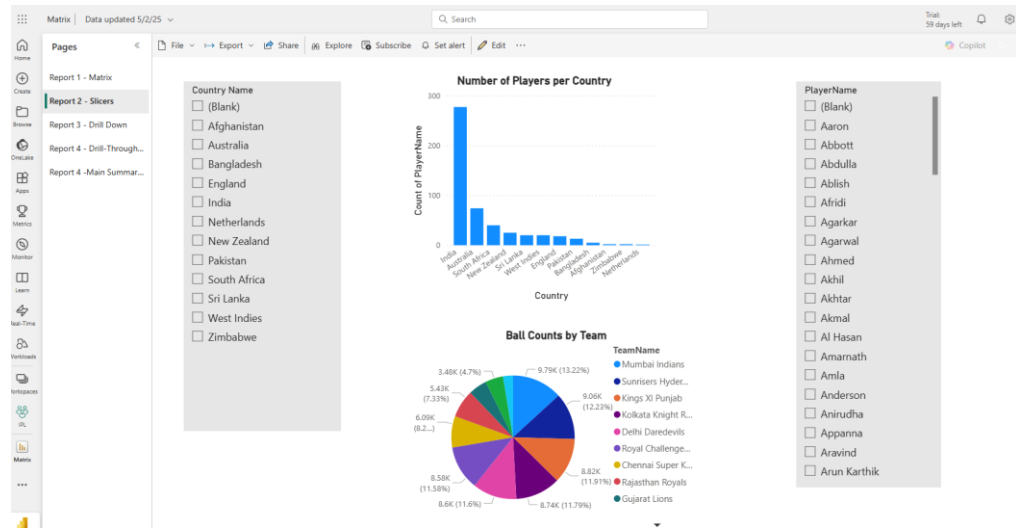
No changes were done manually to relationships as data was pre-modeled in the cube.

- Visual Design

A Matrix visual was used.

- ❖ Rows: Player Name
- ❖ Columns: Day of Week
- ❖ Values: Ball Counts

Report 2: Report with more than one parameter



- Data Preparation

Fields such as Country, Player Name, and Team were selected from the cube.

- Modeling

No manual relationships added; cube structure used as-is.

- Visual Design

- Two slicers were added:

- ❖ First Slicer: Country

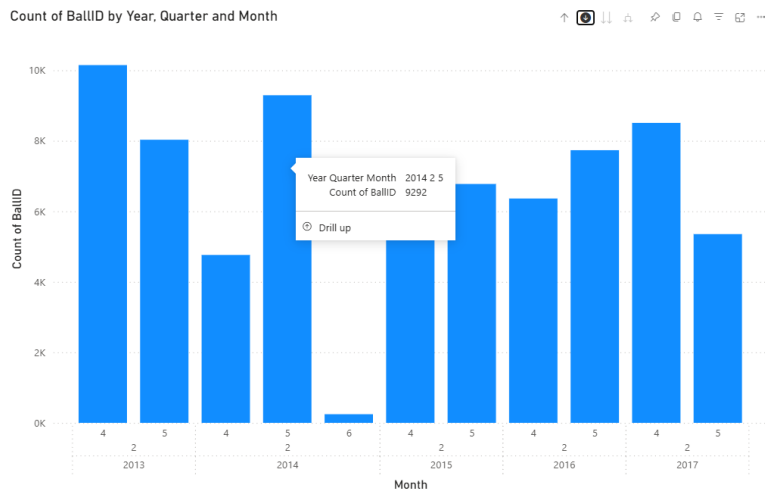
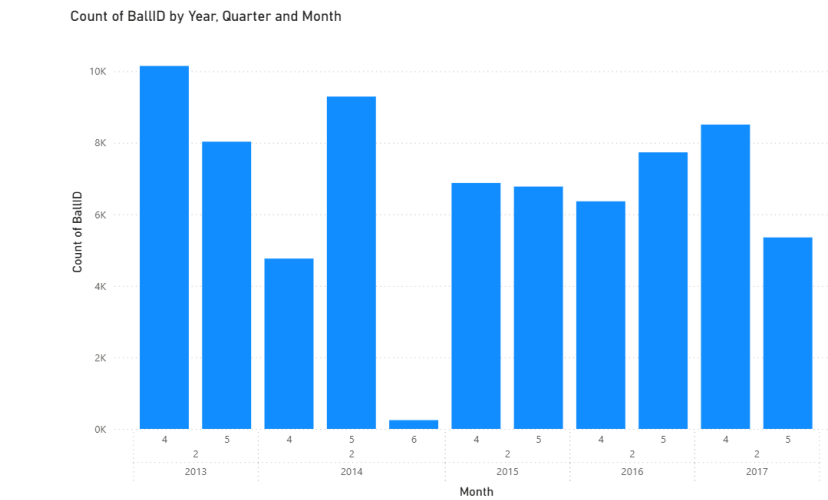
❖ Second Slicer: Players

○ Charts created:

❖ Bar Chart: Number of players per country

❖ Pie Chart: Ball counts by team

Report 3: Drill-down report



- Data Preparation

Year, Quarter, and Month fields were selected from the cube.

- Modeling

No new hierarchies were created manually; Year → Quarter → Month hierarchy was made inside the visual itself.

- Visual Design

A Clustered Column Chart was used.

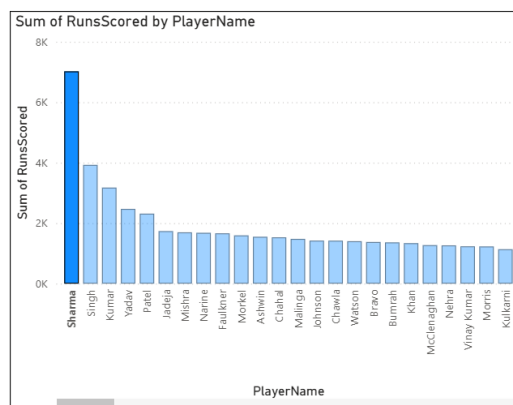
❖ Axis: Year → Quarter → Month (hierarchical drill-down)

❖ Values: Total Runs

Drill-down mode was enabled, allowing users to click and explore deeper into the data by time levels.

Report 4: Drill-through report

Report 1 - Matrix
Report 2 - Slicers
Report 3 - Drill Down
Report 4 - Drill-Through...
Report 4 - Main Summa...



Report 1 - Matrix

Report 2 - Slicers

Report 3 - Drill Down

Report 4 - Drill-Through...

Report 4 - Main Summar...



PlayerName	MatchDate	Sum of RunsScored	VenueName
Sharma	20130405	42	Rajiv Gandhi International Stadium Uppal
Sharma	20130407	44	Rajiv Gandhi International Stadium Uppal
Sharma	20130407	20	Subrata Roy Sahara Stadium
Sharma	20130409	30	M Chinnaswamy Stadium
Sharma	20130411	16	Subrata Roy Sahara Stadium
Sharma	20130412	32	Feroz Shah Kotla
Sharma	20130413	13	MA Chidambaram Stadium, Chepauk
Sharma	20130413	27	Wankhede Stadium
Sharma	20130414	45	Eden Gardens
Sharma	20130415	24	MA Chidambaram Stadium, Chepauk
Sharma	20130417	56	Subrata Roy Sahara Stadium
Sharma	20130418	8	Feroz Shah Kotla
Sharma	20130419	46	Rajiv Gandhi International Stadium Uppal
Sharma	20130420	13	Eden Gardens
Sharma	20130421	28	Punjab Cricket Association Stadium Mohali
Sharma	20130422	19	MA Chidambaram Stadium, Chepauk
Sharma	20130425	73	MA Chidambaram Stadium, Chepauk
Sharma	20130427	59	Sawai Mansingh Stadium
Sharma	20130428	23	MA Chidambaram Stadium, Chepauk
Sharma	20130428	23	Shaheed Veer Narayan Singh International Stadium
Sharma	20130430	47	Subrata Roy Sahara Stadium
Sharma	20130501	43	Rajiv Gandhi International Stadium Uppal
Sharma	20130502	31	MA Chidambaram Stadium, Chepauk
Sharma	20130502	36	Subrata Roy Sahara Stadium
Sharma	20130504	17	Rajiv Gandhi International Stadium Uppal
Sharma	20130505	37	Sawai Mansingh Stadium
Sharma	20130505	19	Wankhede Stadium
Sharma	20130508	108	Rajiv Gandhi International Stadium Uppal
Sharma	20130509	21	Punjab Cricket Association Stadium Mohali
Sharma	20130511	49	Punjab Cricket Association Stadium Mohali
Total		7022	

- Data Preparation

Fields like Player Name and Team Name were selected from the cube.

- Modeling

Drill-through functionality was used without modifying the data model.

- Visual Design

- A Clustered Column Chart was used.
- Added a Drill-Through field on the detail page.
- On the main page, users can right-click a data point and navigate to the detail page to see more information.