



PREDICTING THE OUTCOME OF PSL 2020

Aiming to predict the outcome of PSL 2020 cricket matches using the team configurations and the previous performances of players

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PROBLEM STATEMENT/MOTIVATION

Pakistanis are a very passionate nation. Cricket is a sport that unites the entire nation. The Pakistani nation at large and cricket experts and sports analysts in particular, tend to predict the outcome of the matches, whether its International Cricket World Cup or Pakistan Super League, mostly based on intuition and emotions.

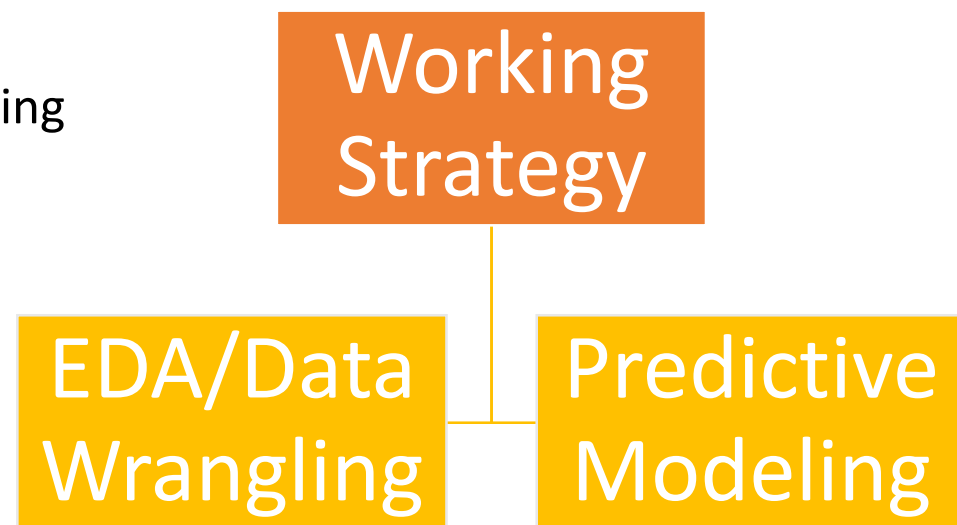
Data analytics can be used to gain a competitive edge and make data driven decisions in players' recommendations and predicting the outcomes of the matches. As the betting industry has grown manifold, cricket continues to play a major role. Predicting the outcomes of these cricket matches based on data analytics will benefit many parties and stakeholders.

DATA USED FOR PREDICTION

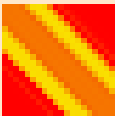
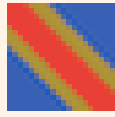
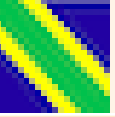
Data was collected and merged from tournaments reports available on the website of Pakistan Cricket Board including points table, score board, batting performance, bowling performance and fielding performance of the players.

We have used the following features for the predictive modeling

- Performance of the players in previous super leagues
- Performance of the players of their opposition teams
- Winning Toss
- Day/Night Match



PSL 2020 TEAM CAPTAINS

Teams		Captains	Players
Islamabad United		Shadab Khan	18
Karachi Kings		Imad Wasim	18
Lahore Qalandars		Sohail Akhtar	17
Multan Sultans		Shan Masood	19
Peshawar Zalmi		Darren Sammy	19
Quetta Gladiators		Sarfraz Ahmed	19

6 Teams | 110 Players | 1 Cup

PSL HISTORICAL PLAYERS (2016-2020)

Teams	2016	2017	2018	2019	2020	Total
Islamabad United	20	20	18	21	18	97
Karachi Kings	19	15	18	17	18	87
Lahore Qalandars	16	14	21	26	17	94
Multan Sultans	*	*	14	20	19	53
Peshawar Zalmi	18	19	21	19	19	96
Quetta Gladiators	17	20	19	18	19	93
Total	90	88	111	121	110	520

Note: Players for PSL 2020 teams' squad can expected to be greater by the end of series

Source: Pakistan Cricket Board "HBL Pakistan Super League" Tournaments Reports

PSL UNIQUE PLAYERS

252: UNIQUE PLAYERS THAT HAVE PARTICIPATED IN PSL SERIES

Teams	Total Players	Unique Players	Percentage of Unique Players
Quetta Gladiators	93	58	62.37%
Peshawar Zalmi	96	55	57.29%
Multan Sultans	53	42	79.25%
Lahore Qalandars	94	72	76.60%
Karachi Kings	87	57	65.52%
Islamabad United	97	55	56.70%
Grand Total	520	252	48.46%

Note: Islamabad United and Peshawar Zalmi have least number of unique players which shows the consistency in their team squad. Multan Sultan and Lahore Qalandars have maximum number of unique players which shows these teams have least constant or most variety of players.

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

PSL FOREIGN PLAYERS

132: UNIQUE FOREIGN PLAYERS THAT HAVE PARTICIPATED IN PSL SERIES

Teams	2016	2017	2018	2019	2020	Grand Total
Islamabad United	8	7	6	6	7	34
Karachi Kings	7	5	8	5	5	30
Lahore Qalandars	5	5	8	7	7	32
Multan Sultans	*	*	6	3	7	16
Peshawar Zalmi	5	7	7	8	7	34
Quetta Gladiators	7	6	10	7	6	36
Grand Total	32	30	45	36	39	182

Note: Quetta Gladiators have most foreign/overseas players ever in PSL. Followed by Islamabad United and Peshawar Zalmi with an equal 34 total players each.

Source: Wikipedia “Pakistan Super League” Team Squad

WHICH TEAM IS MORE OVERSEAS

	2016		2017		2018		2019		2020	
	National	Overseas	National	Overseas	National	Overseas	National	Overseas	National	Overseas
Islamabad United	60%	40%	65%	35%	67%	33%	71%	29%	61%	39%
Karachi Kings	63%	37%	67%	33%	56%	44%	71%	29%	72%	28%
Lahore Qalandars	69%	31%	64%	36%	62%	38%	73%	27%	59%	41%
Multan Sultans					57%	43%	85%	15%	63%	37%
Peshawar Zalmi	72%	28%	63%	37%	67%	33%	58%	42%	63%	37%
Quetta Gladiators	59%	41%	70%	30%	47%	53%	61%	39%	68%	32%

Note: In PSL 2019, both finalist teams Quetta Gladiators and Peshawar Zalmi had the highest share of overseas players in their team and within PSL 2020, Lahore Qalandars have the highest share of overseas players in their team

Source: Wikipedia "Pakistan Super League" Team Squad

PSL SQUARD SWITCHERS

SOHAIL TANVIR HAVE PLAYED TOWARDS 4 TEAMS IN 5 PSL

<u>Name</u>	Team	Year
Sohail Tanvir	Karachi Kings	2016
Sohail Tanvir	Lahore Qalandars	2017
Sohail Tanvir	Multan Sultans	2018
Sohail Tanvir	Quetta Gladiators	2019
Sohail Tanvir	Multan Sultans	2020

Aamer Yamin, Bilawal Bhatti, Cameron Delport, Dwayne Smith, Hammad Azam, Iftikhar Ahmed, Kieron Pollard, Kumar Sangakkara, Mohammad Irfan Jr, Rahat Ali Riki Wessels, Shahid Afridi, Shoaib Malik, Sohaib Maqsood, Sohail Khan, Tymal Mills and Umar Amin have played towards 3 Teams in 5 PSL Series.

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

MOST LOYAL PLAYERS

(PARTICIPATED 5 TIMES IN SAME TEAM)

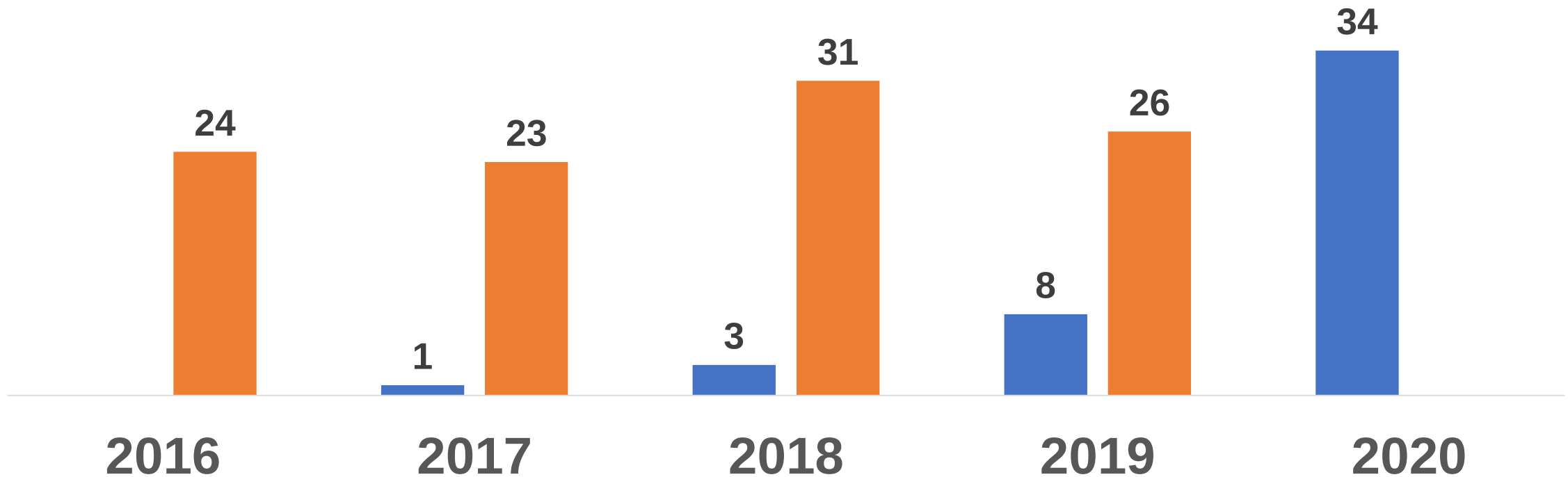
The most loyal players within each team include:

- **Rumman Raees and Asif Ali from Islamabad United**
- **Imad Wasim from Karachi Kings**
- **Wahab Riaz, Kamran Akmal, Hasan Ali, Darren Sammy from Peshawar Zalmi**
- **Sarfraz Ahmed, Mohammad Nawaz and Anwar Ali from Quetta Gladiators**

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

PSL COUNTRY VENUE

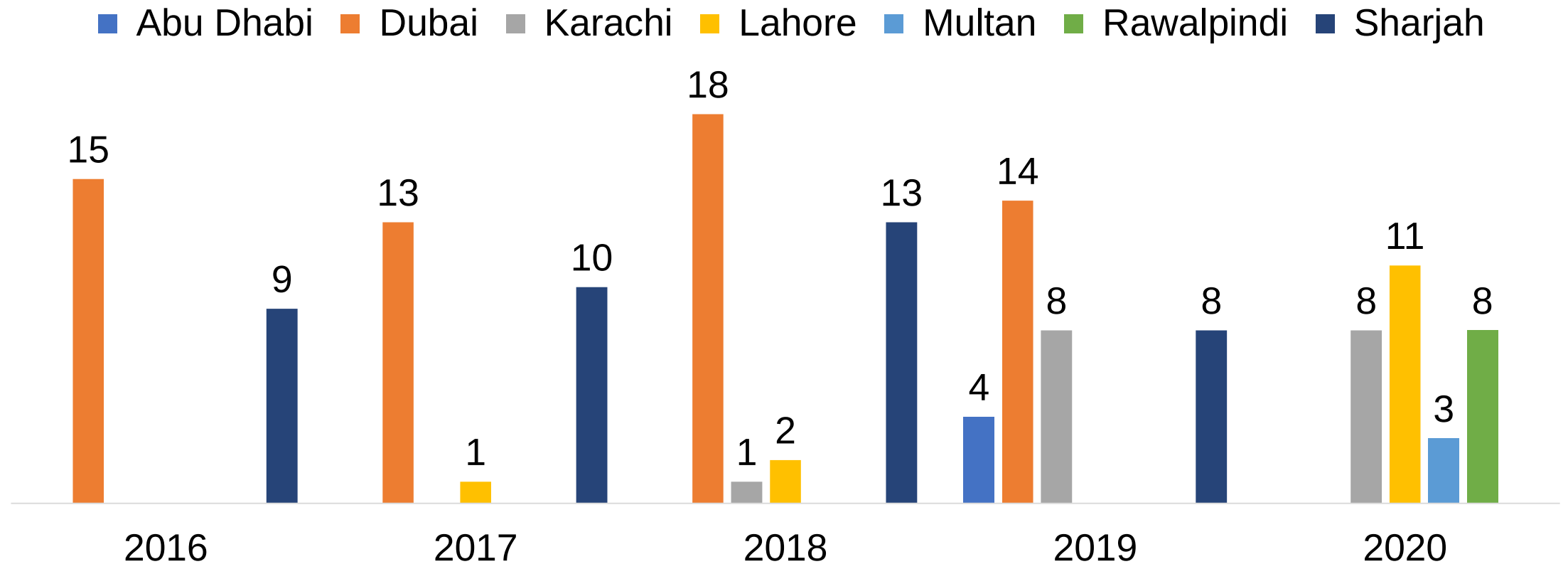
■ Pakistan ■ United Arab Emirates



150 MATCHES | 2 COUNTRIES

Source: Pakistan Cricket Board "HBL Pakistan Super League" Tournaments Reports

PSL CITY VENUE



150 MATCHES | 7 CITIES

Source: Pakistan Cricket Board "HBL Pakistan Super League" Tournaments Reports

PSL GROUNDS/STADIUMS

Stadiums	2016	2017	2018	2019	2020	Grand Total
Dubai International Cricket Stadium	15	13	18	14		60
Sharjah Cricket Stadium	9	10	13	8		40
Gaddafi Stadium		1	2		11	14
National Stadium			1	8	8	17
Sheikh Zayed Stadium				4		4
Rawalpindi Cricket Stadium					8	8
Multan Cricket Stadium					2	2
Multan Cricket Club Ground					1	1
Grand Total	24	24	34	34	30	146

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

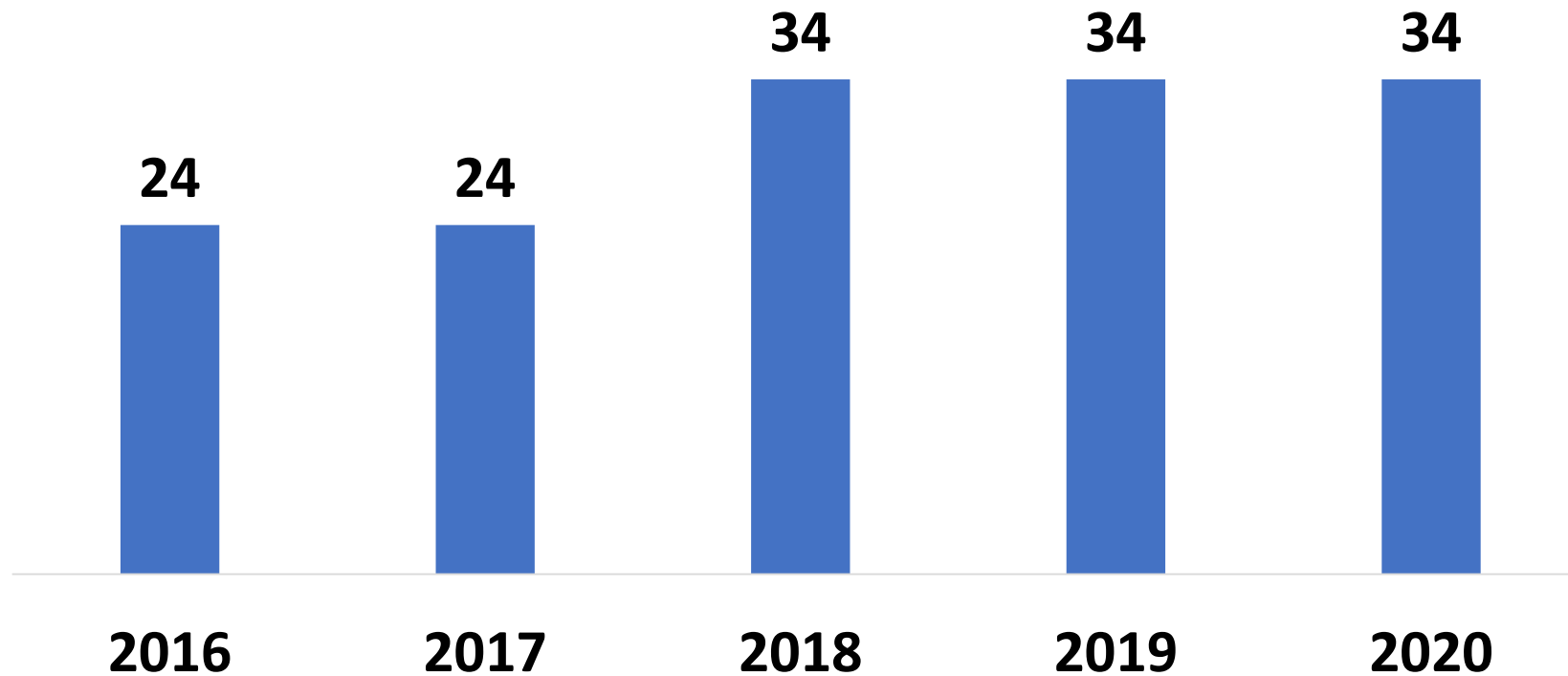
PSL MATCHES PLAYED/WILL BE PLAYED

Teams	2016	2017	2018	2019	2020	Total
Islamabad United	11	9	12	12	10	54
Lahore Qalandars	8	8	10	10	10	46
Karachi Kings	9	10	12	11	10	52
Peshawar Zalmi	10	11	13	13	10	57
Multan Sultans	*	*	10	10	10	30
Quetta	10	10	11	12	10	53
Minimum Matches*	8	8	10	10	10	

Note: Multan Sultans didn't play in PSL 2016-17. Teams with more than 8 matches played in PSL 2016-17 and teams with more than 10 matches in PSL 2018-19 have qualified for the playoff/elimination rounds.

Source: Pakistan Cricket Board "HBL Pakistan Super League" Tournaments Reports

PSL MATCHES PLAYED/TO BE PLAYED



Source: *Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports*

Day vs. Night Matches Frequency

Years	Day	Night	Grand Total
2016	8	16	24
2017	6	18	24
2018	10	24	34
2019	12	22	34
2020	8	26	34
Grand Total	44	106	150

Note: Mostly (70%) of the matches played in PSL were organized at night

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

TOSS WINNING FREQUENCY

Teams	2016	2017	2018	2019	Grand Total
Quetta Gladiators	7	6	7	8	28
Peshawar Zalmi	7	6	6	7	26
Karachi Kings	4	5	7	8	24
Islamabad United	5	4	4	6	19
Lahore Qalandars	1	3	5	2	11
Multan Sultans			5	3	8
Total	24	24	34	34	116

Note: Quetta Gladiators won the toss 28 times, followed by Peshawar Zalmi 26 times and Karachi Kings 19 times in the history of PSL. Multan Sultans have participated for the first time in 2018 but Lahore Qalandars always seem to have bad luck.

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

MATCH WIN FREQUENCY

Teams	2016	2017	2018	2019	Grand Total
Islamabad United	7	4	8	5	24
Karachi Kings	2	5	5	5	17
Lahore Qalandars	2	3	2	4	11
Multan Sultans			4	3	7
Peshawar Zalmi	6	6	7	8	27
Quetta Gladiators	7	5	5	9	26
Match tied/Match abandoned/No result		1	3		4
Total	24	24	34	34	116

Note: Peshawar Zalmi won 27 times, followed by Quetta Gladiators 26 times and Islamabad United 24 times in the history of PSL. Multan Sultan have participated for first time after 2018 but Lahore Qalandars always seem to have bad luck.

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

TOSS WINNER DECISION

Teams	2016	2017	2018	2019	Grand Total
Islamabad United	5	4	4	6	19
field	5	4	4	6	19
Karachi Kings	4	5	7	8	24
bat	2		4	2	8
field	2	5	3	6	16
Lahore Qalandars	1	3	5	2	11
bat			2		2
field	1	3	3	2	9
Multan Sultans			5	3	8
bat			1		1
field			4	3	7
Peshawar Zalmi	7	6	6	7	26
bat	2	1	3		6
field	5	5	3	7	20
Quetta Gladiators	7	6	7	8	28
bat	1		1		2
field	6	6	6	8	26

- Strategy for Islamabad United to win a game is to field first.
- Karachi Kings have chosen to field first twice after winning the toss.
- Peshawar Zalmi and Quetta Gladiators are always Risk taker.

Source: Pakistan Cricket Board "HBL Pakistan Super League" Tournaments Reports

WINNING FREQUENCY

Teams	1st	2nd	Grand Total
Islamabad United	6	18	24
Karachi Kings	9	8	17
Lahore Qalandars	6	5	11
Multan Sultans	2	5	7
Peshawar Zalmi	12	15	27
Quetta Gladiators	6	20	26
Total	41	71	112

Note: Historical Data of Winners shows teams have benefit to play in second innings. 63% of the matches been won by the teams who played in second innings.

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

Competition amongst teams

		Winner						
		Islamabad United	Karachi Kings	Lahore Qalandars	Multan Sultans	Peshawar Zalmi	Quetta Gladiators	Total
Runner	Islamabad United	-	4	3	2	5	5	19
	Karachi Kings	8	-	2	0	8	5	23
	Lahore Qalandars	4	5	-	2	7	5	23
	Multan Sultans	2	3	2	-	2	3	12
	Peshawar Zalmi	6	2	1	2	-	8	19
	Quetta Gladiators	4	3	3	1	5	-	16
	Total	24	17	11	7	27	26	112

Historical Data of Winners and their runner ups shows that Islamabad United's biggest rival/opposition team is Quetta Gladiators and Peshawar Zalmi who defeated them. Karachi Kings' biggest rivals are Islamabad United and Peshawar Zalmi who beat them. Biggest opposition of Lahore qalandars are Peshawar Zalmi. Biggest rival of Peshawar Zalmi are Quetta Gladiators who beat them 8 times and Islamabad United who beat them 6 times. Quetta Gladiators find it challenging to faceoff Peshawar Zalmi and Islamabad United.

YOUNGEST TEAM

Average Age of the Players in Team Squad

Teams	2016	2017	2018	2019	2020	Grand Total
Islamabad United	35.20	33.50	30.72	28.48	26.61	30.97
Karachi Kings	31.16	32.40	30.39	29.88	29.11	30.54
Lahore Qalandars	32.06	30.86	30.90	30.92	30.00	30.94
Multan Sultans			33.50	31.05	29.84	31.26
Peshawar Zalmi	34.06	32.32	30.81	31.11	28.11	31.24
Quetta Gladiators	35.41	32.50	31.21	29.67	28.32	31.37
Grand Total	33.60	32.41	31.15	30.21	28.65	31.04

Note: In the beginning of the PSL, Lahore team had more experienced players in their team squad. Teams are gradually providing more opportunities to the to young and new players. In PSL 2020, Islamabad United has lowest average age of players.

Source: Pakistan Cricket Board “HBL Pakistan Super League” Tournaments Reports

WHICH TEAM GAVE MORE OPPORTUNITIES TO YOUNGSTERS

Name	Team	Age
Akif Javed	Islamabad United	19
Muhammad Musa	Islamabad United	19
Arshad Iqbal	Karachi Kings	19
Shaheen Afridi	Lahore Qalandars	19
Rohail Nazir	Multan Sultans	18
Aamir Ali	Peshawar Zalmi	17
Haider Ali	Peshawar Zalmi	19
Mohammad Amir Khan	Peshawar Zalmi	18
Aarish Ali Khan	Quetta Gladiators	19
Naseem Shah	Quetta Gladiators	17

Note: Peshawar Zalmi have 3 players under 19 in their team squad.

Source: Pakistan Cricket Board “**HBL Pakistan Super League**” Tournaments Reports

VARIABLES USED FOR PREDICTION

Predictive Data Model was developed for the HBL Super League Series 2020 using the historical data of 4 previous series. It is believing this predictive analysis strategy would be useful for viewers, sponsors and team strategists. Initially model was trained on the data for PSL 2016-2018 and model was tested for PSL 2019 for to measure the accuracy of predictions. For Final predictive model data for PSL 2019 was made part of historical data and predictions were made for the PSL 2020

Features used for the predictive Modeling

All the features in the dimension of Bating, Bowling and Fielding performance of the players were used including;

Bating: Number of innings bated, Number of times not out, Total Runs made by the players, Hisgest strike rate in the series, Average Score of Players, Number of times 100 was done and number of times 50 was made.

Bowling: Number of Balls thrown, Number of maiden overs, Number of Runs bowler have received, No of wickets taken, Best Bowling Score, Bowling Average, No of 4 Wickets taken, Number of 5 wickets takes, Number of Strike Rate and Economy Rate.

Fielding: Catches taken, Number of times Stamped, number of times total dismissals

VARIABLES USED FOR PREDICTION

- LR1 Logistic Regression Accuracy 66%
- LR2 Logistic Regression Accuracy 77%
- NN1 Neural Network Accuracy 76%
- NN2 Neural Network Accuracy 73.3%

Contact Us:

isb@gallup.com.pk

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