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**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH
TECHNOLOGY****INSIGHTS ON IPL TEAM PERFORMANCE USING VISUAL ANALYTICS****S. Sharuka, R.Vani**

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ABSTRACT

Cricket is an important part of culture in India and the Indian Premier League matches are one of the most important events in India. It is a major professional cricket league in India contested by eight teams representing the different cities in India. The paper focuses on the performance analysis of the eight contesting IPL teams based on the runs of the team, wickets, decisions taking on winning the toss and Duckworth Lewis rule analysis. The IPL data from 2008 to 2019 is utilized for the player analysis. The team performances are visualized graphically using tableau to render the interpretation in an effective manner. The performance data using visual analytics helps in selecting players for future matches and provides additional information on player as well as team profiles.

KEYWORDS: visual analytics, tableau, IPL, cricket, performance.**1. INTRODUCTION**

Cricket is the most popular sports in India by far, and is played almost everywhere in India. The Indian cricket team has won the Cricket World Cup in 1983. This is followed by the 2007 ICC World Twenty20, the 2011 Cricket World Cup, 2013 ICC Champions Trophy. In 2002 India shared the 2002 ICC Champions Trophy with Sri Lanka. The Ranji Trophy, the Deodhar Trophy, the Irani Trophy, NKP Salve Challenger Trophy, the Vijay Hazare Trophy and the Duleep Trophy are some of the domestic competitions in India. In addition, the BCCI conducts the Indian Premier League known as IPL which is a limited overs competitions. The Twenty20 competition as it is better known, is one of the biggest sports leagues in the world and the biggest cricket league in the world. While cricket is by far the most popular sport in the country it does not feature as the country's national sport. Cricket features as a prominent part of the Indian culture. The limited overs matches have become more popular and have seen a rapid growth in the years 2016-18. The IPL as a whole was valued by financial experts at \$4.16 Billion US Dollars in 2016, but that number grew to \$5.3 Billion in 2017 and \$6.13 Billion in 2018. [1]

Matches are scheduled in late afternoon or evening so as to ensure that a part of them at least are played under floodlights at night. This is done to increase the viewership of the matches for television audience worldwide. Initial, league matches are played on a home-and-away basis across all teams. With the planned expansion to 10 clubs in 2011(2 groups of five each), that format has been revised. Currently matches between some teams would be limited to a single encounter. The top four teams contest three play-off matches, with one losing team being given a second chance to reach the final, which has been introduced with an aim of maximizing potential television revenue. The play-off portion of the tournament involves the four teams that finished at the top of the tables in a series of knockout games that allows one team which had lost its first-round game a second opportunity to advance to the final match. In this paper we perform the analysis of the IPL cricket teams from 2008 to 2019. Factors such as run rate of the teams, number of wickets obtained by bowlers, decisions on toss are analyzed graphically. Also the analysis of the Duckworth Lewis rule and match winner analysis is done. Using this analysis we analyze that which team has a chance to win next time, which team has a strong batting power and strong bowling power. We also analyze that which player will be best for their future team for high competence. SK Rastogi *et al.* have in their paper discussed a methodology of player pricing and valuation of cricketing attributes [2]. D Parker *et al.* in their paper have performed the IPL players evaluations.[3]. S Singh presented a methodology for measuring the performance of team in IPL [4]. C Peterson *et al.* worked on performance evaluation of IPL season [5]. All analysis in current paper is done through tableau tool. The rest of the paper is organized as follows: Section 2 provides a description of the IPL data for the years, Section 3 gives



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a overview of the tool used for the data analysis, the visualizations of the IPL data are presented in the section 4 with the related discussions, section 5 concludes the paper.

2. DATASET DESCRIPTION

The section describes the IPL dataset providing information on team performance from 2008 to 2019. The section provides details on the attributes, instances, missing values in the dataset.

Number of attributes: 18

Number of instances: 756

Missing values: N/A

ID –The attributes contains the information about the unique id for a match.

SEASON –The attribute contains the information about the year when the match has been conducted.

CITY - The attribute hold the information about the city where the match took place.

DATE – The attribute holds the information about the date when the match has been held.

TEAM 1 – The attribute describes that which team is going to bat first.

TEAM 2 – The attribute describe that which team is going to bat second.

TOSS_WINNER – The attribute holds the information about who wins the toss in that match.

TOSS_DECISION – The attribute contains the information about the decision (bat/field) taken by the toss winner.

RESULT – The attribute contains information about the result (normal/tie) of the players.

DL_APPLIED – The attribute describe whether the.

Duckworth Lewis (DL) rule is applied.

WINNER – The attribute hold the information about the winner of the match.

WIN_BY_RUNS – The attribute describe that which team had win by runs.

WIN_BY_WICKETS – The attribute describe that which team had win by wickets.

PLAYER_OF_MATCH – The attribute contains information about the man of the match.

VENUE – The attribute contains information about in which place the match has been played.

UMPIRE 1 – The attribute contain information about the names of the umpire 1.

UMPIRE 2 – The attribute contain information about the names of the umpire 2.

UMPIRE 3 – N/A.

3. TOOL DESCRIPTION

Tableau is a business intelligence tool suited for visual analytics. It allows users to create and share an interactive dashboard. Dashboards are used in tableau to depict the trends, variations, and density of the data in the form of graphs and charts. It can be used to connect to files, relational and also big Data sources to procure and process data. An important feature is the data blending and real-time collaboration, which is indispensable for reporting. It is used by businesses, academic researchers, and many government organizations for visual analytics. The tool ranks as the best among business intelligence and analytics platforms in Gartner magic quadrant.

Data analysis is speedy with Tableau. The visualizations created take the form of dashboards and worksheets. The reports created using Tableau are suitable for all levels of professionals in an organization. The ease of use enables novices and beginners to easily adapt to the tool to customize the dashboards. The tool allows provisions to provide solutions for several industries, departments, and data environments. The features of Tableau which makes it versatile for various applications are as follows:

Speed of Analysis – Since the usage of the tool does not require high level of programming expertise, any user with access to data can start using it to derive value from the data.

Reliant – Easy installation allows for all users to enable Tableau and use it with utmost ease. Commonly used is the desktop version which is preferred over other versions as it contains a majority of the features required to do a complete data analysis.

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Visual Discovery – Tableau allows the user to explore and analyze the data using visual elements such as charts, bar graphs, trend lines, color and highlighting. Scripting is required to a minimum as most of the output required can be generated using drag and drop.

Blend Diverse Data Sets –The data blending feature allows the combining data from various sources such as relational tables, raw data in real time, semi structured data to provide effective tabulations and representations. It is provides a low cost alternative and shields the users from worrying on how the data may actually be stored.

Architecture Neutral – Tableau lends itself to being run on various devices. The users do not need to consider the hardware or software specifications needed to run the tool.

Real-Time Collaboration – Tableau can filter, sort, and discuss data on the fly and embed a live dashboard in portals like SharePoint site or Sales force. You can save your view of data and allow colleagues to subscribe to your interactive dashboards so they see the very latest data just by refreshing their web browser. Tableau's best features include the Data Blending, Real time analysis and collaboration of data. [6]

4. ANALYSIS AND INTERPRETATION

A. Analyzing winner and win by runs

From the analysis of the visualization we observe that the Mumbai Indians, Chennai super kings, Royal challengers Bangalore are the top three successful team throughout the IPL cricket from 2008 to 2019 . It can be concluded from this that there is a more chance for these teams to win in the upcoming match i.e. (2020) because their batting team is better than their bowling team. Figure 1 represents the teams by runs. To continue this success the sponsor has to select the best batting player from the top player of the match to their team this will lead to success.

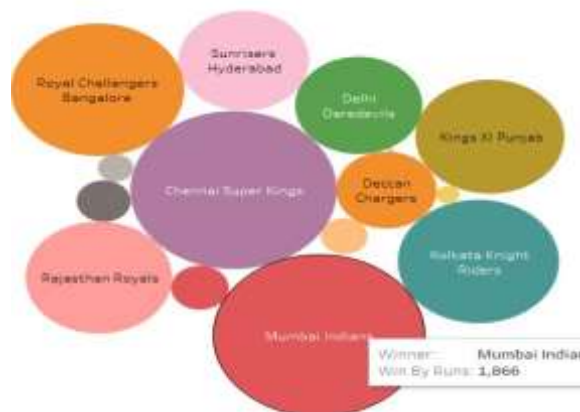


Figure 1. Analyzing winner and win by runs.

B. Analyzing winner who win by wickets

Kolkata knight riders, Royal challenger Bangalore, Mumbai Indians are the most successful team by wickets from 2008 – 2019. We can also analyze that their bowling team is best than their batting team. If they get best bowler by their sponsor they will be a successful team to the next time. Mumbai Indians and Royal challenger Bangalore had both strong batting power and bowling power so they both have more chance then other team to win.

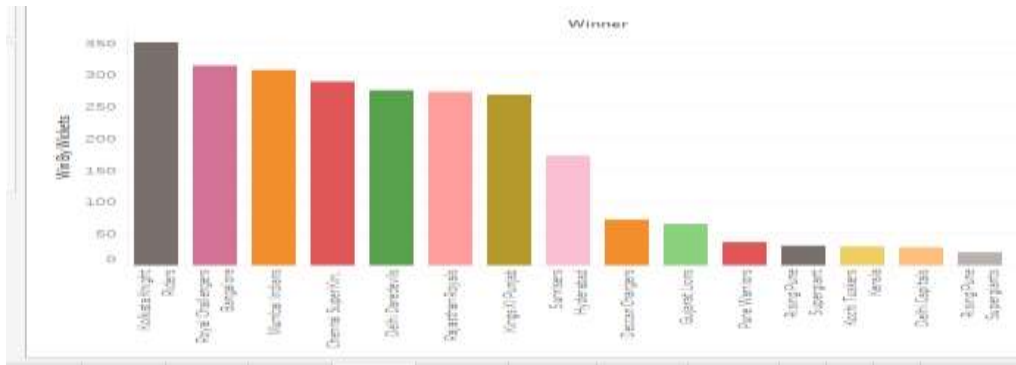


Figure 2. Analyzing winner winning based on wickets

C. Toss winner who win by runs

In this section we have analyzed the toss winners who had win by runs and we analyze that Chennai super kings, Mumbai Indians, Royal Challengers Bangalore had mostly win the toss and they win by runs this may be done because batting team is stronger. Fig 3 depicts the toss winners who win by runs.



Figure 3. Toss winner who win by runs

D. Analyzing toss decisions with runs and wickets

The two visualizations in Fig 4 show that the team who had chosen fielding is the most successful team than the batting team. It can be inferred that if they choose fielding it will help them to win because the fielding team will be strong and they know how to move the game based upon the opposite team.

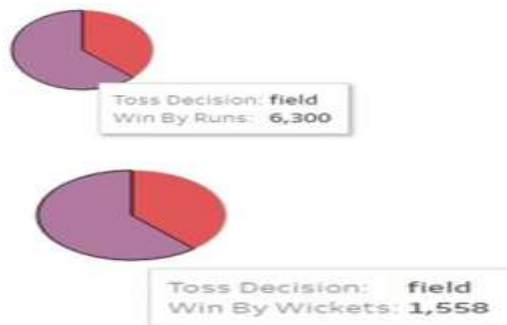


Figure 4. Toss decisions with runs and wickets

E. Analyzing player of the match by their runs scored

From the visualization in Figure 5 we analyze that Chris Gayle, Willers, Dhoni, Raina are the top most player of the match. Chris Gayle is a international cricketer who plays for west indies he is the top most player in the IPL match. He is the fastest batsman to score 4000 runs in IPL and also the first to hit 300 sixes in IPL. If the sponser choose him as the topmost player to their team they will have a chance to win next time.

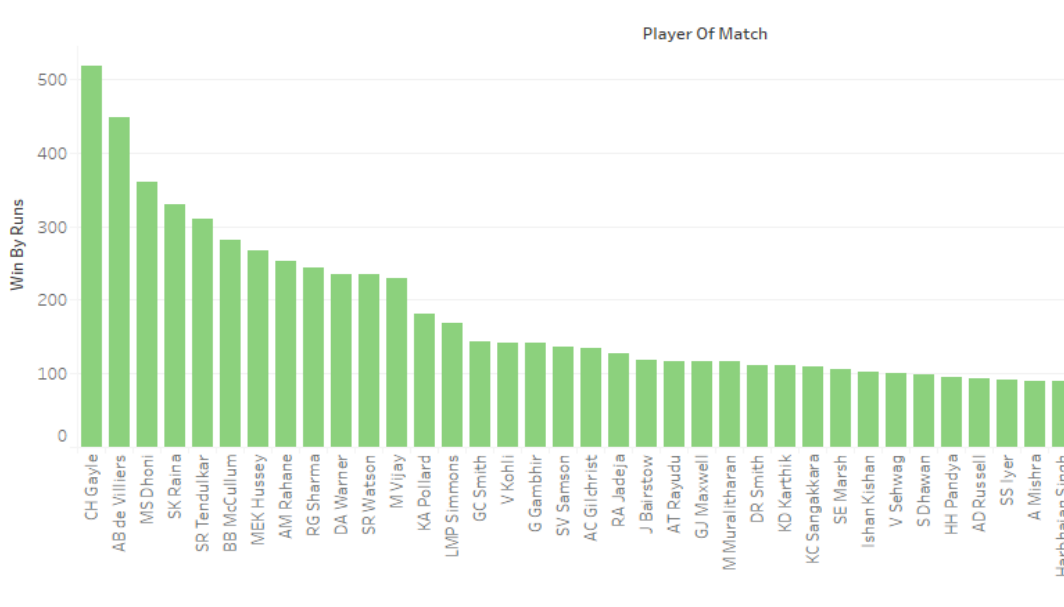


Figure 5. Player of match analysis

F. Analyzing player of match by their wickets

From Figure 6 graph, we analyze that the players Gambhir, Pathan, CH Gayle are the top most players of the match who win by wickets. Gambhir is a successful player who has won the IPL title two times. Owing to him Kolkata Knight Riders is a most successful team in bowling. It can be safely presumed that if his playing is the same in upcoming match then that team will be successful in bowling. It is evident that CH Gayle has both batting as well as winning power so that the team who chooses him will increase their chances of winning.

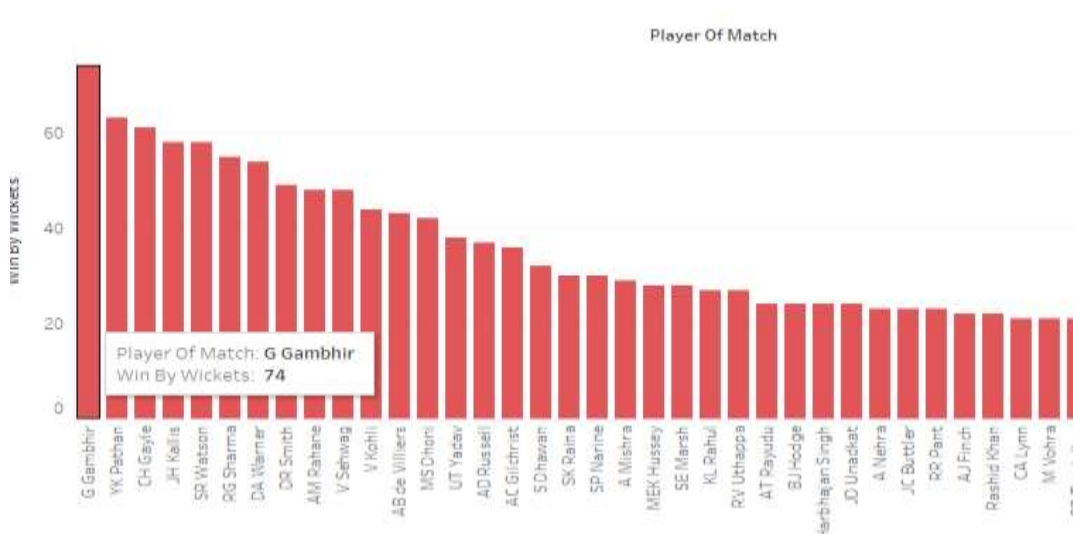


Figure 6. Analyzing player of match based on wickets

G. Analyzing winner with Duckworth Lewis

The Duckworth–Lewis–Stern method (DLS) created by Frank Duckworth and Tony Lewis is basically a mathematical formula used to derive the target score for the team which bats second in a limited over cricket match which has been disrupted due to adverse weather conditions.

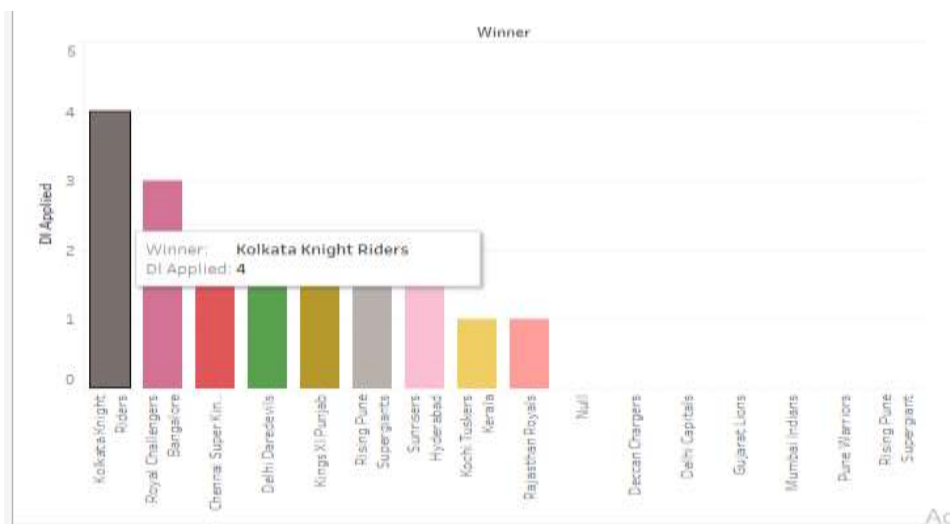


Figure 7. DL rule analysis

Earlier known by the name Duckworth–Lewis method (D/L), it was officially adopted in 1999 by ICC. When it is not possible to complete all overs and with the availability of limited overs, setting an adjusted target for the team batting second is not as easy as reducing the run target proportionally to the loss in overs. The technique is an attempt to ensure that a statistically fair target is set for the second team's innings, having the same difficulty level as the first team's. Each team in a limited overs match has two resources available using which they can score runs (overs to play and wickets remaining). Using the rule the target is adjusted proportionally to the change in the combination of these two resources. [7]

Using the DL applied field in the dataset the graphs is generated for the matches affected by the adverse weather conditions. In the above visualization Duckworth Lewis rule is mostly applied to the Kolkata Knight Riders, Royal Challengers Bangalore and Chennai super kings as the matches were held in adverse weather conditions like rain.

5. CONCLUSION

In the paper we focus on IPL team data from matches played from 2008 to 2019. The analysis may be used for future decisions based on visualization. The observations may also be utilized for publications in various media for better understanding of the performance of the IPL teams. Here we analyze the performance of the IPL players with respect to the following: Most successful team by runs, most successful team by wickets, Overall performance of the team, Man of the match by runs and wickets, Toss winners by runs, Toss winner by wickets, Duckworth rule analysis of winners. It can be observed that the toss plays a vital role in deciding the winning team. This overall analysis is based on visualizations using tableau. The significant beneficiaries are the sponsor (to choose the effective team and team members), players (to improve their self efficiency in their upcoming tournament) and also used for fans (they will be curious enough to guess the winners of the next tournament).

6. ACKNOWLEDGEMENT

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