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Concept Paper

# A Comprehensive Player Ranking System for ODI Cricket Based on Relative Grading Performance

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**Abstract:** Performance analysis (PA) in cricket plays a crucial role in evaluating players and teams based on their on-field contributions. Traditional ranking systems rely on fixed point calculations, often failing to account for contextual factors such as the strength of the opponent or a player's experience level. This study identifies the limitations of conventional performance metrics and proposes a novel methodology that enhances fairness and accuracy in ranking players. The proposed approach is built upon two fundamental principles: (1) the quality of a win is determined by the strength of the opponent, ensuring that victories against stronger teams yield higher points, and (2) debut players are assessed differently from experienced players to reflect their evolving performance potential. By integrating these strategies, our methodology provides a comprehensive framework for evaluating individual and team performance in a more balanced and meaningful manner. Findings indicate that the revised ranking system offers improved fairness in assessing player contributions, mitigating biases in traditional ranking methods. This approach can significantly impact team selection, strategy formulation, and talent development in cricket. Future research can extend this model to other sports, enhancing performance evaluation across different competitive domains.

**Keywords:** cricket rules; player performance; cricket; qualitative approach; elite ranking

## 1. Introduction

A common question arises: why has cricket been chosen over other sports for this study? The primary reason, as cited by WorldAtlas.com, is that cricket has the second-largest fan base globally, with approximately 2.5 billion fans, following soccer, which has around 4 billion fans. This is particularly noteworthy given that fewer countries play cricket compared to soccer, yet its fan following is remarkably vast. In countries like India, every citizen is familiar with the rules and regulations of the game. However, do we truly understand how a player is ranked in terms of batting skills, bowling skills, all-round performance (batting and bowling), team contribution, and overall rankings? The answer is no. We simply follow the rankings projected by the International Cricket Council (ICC) without knowing the exact methodology behind them. The ICC follows a ranking system formulated by a committee, which is then approved by all cricket-playing nations.

Upon analyzing the ICC player rankings, it appears that the current system is somewhat simplistic, comparable to evaluating a school-level game rather than a professional international sport. For instance, consider a match from the Asia Cup, played on March 13, 2012, in Dhaka. In that game, Virat Kohli, batting at the No. 3 position, scored 108 runs off 148 balls, whereas Gautam Gambhir, as an opener, scored 100 runs off 171 balls. Despite Kohli's outstanding innings, he did not earn more points than Gambhir. At first glance, this may seem reasonable since Gambhir also scored a century. However, what needs to be questioned is the fairness of the ranking system. Kohli made his international debut on August 18, 2008, while Gambhir debuted much earlier, on April 11, 2003. Furthermore, openers generally get more opportunities to build an innings compared to middle-order batsmen. Similarly, experienced players tend to perform better than newer players.

Another crucial factor influencing a batsman's performance is the quality of the opposition's bowling attack. A bowler's experience, economy rate, number of wickets taken, bowling average, and number of extras bowled all contribute to the difficulty of scoring runs. These factors should be considered when calculating a batsman's points rather than solely relying on the total runs scored.

Additionally, the playing conditions and venue significantly impact player performance. For instance, Indian batsmen generally excel on subcontinent pitches (India, Sri Lanka, Pakistan, Bangladesh, Afghanistan) but may struggle in overseas conditions such as England, Australia, or the West Indies due to pitch variations. Asian pitches favor spin bowling, whereas overseas pitches often assist pace bowlers. Consequently, a batsman's performance should be evaluated differently based on the conditions in which they play.

Another aspect that must be considered is the time spent on the field. A player who remains on the field throughout the match has a greater impact than one who spends significant time on the bench. Similarly, captains experience additional pressure compared to other players. Moreover, a batsman chasing a target under pressure should be evaluated differently from one who bats in the first innings under no scoreboard pressure.

This paper highlights these discrepancies in the current ranking system and proposes a revised methodology that accounts for these factors. In addition to considering runs scored, this approach includes aspects such as boundaries (fours and sixes), strike rates, and match conditions. Similarly, new criteria for evaluating bowlers and fielders are also discussed in detail in the following sections.

## 2. Batsman

### *A ODI Matches*

First, we will calculate the points for a batsman based on the runs scored, as shown in Table 1. The points for an opening batsman are determined by the score obtained in a match.

**Table 1.** Points with respect to scores obtained in a match.

Score	Points	Score	Points	Score	Points	Score	Points
Duck	-1	60's	20	120's	64	180's	152
10's	2	70's	24	130's	72	190's	168
20's	4	80's	28	140's	80	200's	200
30's	6	90's	32	150's	104	210's	224
40's	8	100's	48	160's	120	220's	248
50's	16	110's	56	170's	136	230's	272

Next, the batsman's status at the completion of the innings is considered. If the batsman is out, no additional points are awarded (0 points). However, if the batsman remains not out, modified points are given based on the score, as shown in Table 2.

**Table 2.** Points for Not Out Status in a match.

Score	Points	Score	Points
Less than 30	2	101 to 150	5
30 to 50	3	151 to 200	6
51 to 100	4	200 plus	7

Following this, the batting position of the player is crucial. Batsmen at different positions have varying opportunities to perform. For instance, in the 2011 ODI World Cup, Indian captain Mahendra Singh Dhoni usually came to bat after the 40th over, except in the final. Meanwhile, top-order batsmen consistently had more opportunities to score. Therefore, different points are allocated based on the batting position, as shown in Table 3.

**Table 3.** Points for wicket order in an innings.

Wicket	Points	Wicket	Points	Wicket	Points
1 <sup>st</sup>	2	4 <sup>th</sup>	8	7 <sup>th</sup>	14
2 <sup>nd</sup>	4	5 <sup>th</sup>	10	8 <sup>th</sup>	14
3 <sup>rd</sup>	6	6 <sup>th</sup>	12	9 <sup>th</sup>	14

Next, the number of boundaries (fours and sixes) is considered. Boundaries put pressure on the opposition and highlight a batsman's skill. The points for boundaries are listed in Table 4.

**Table 4.** Points for boundaries.

Boundaries	Points
Four	1
Six	3

Additionally, a batsman's strike rate is an important factor. The calculation applies to innings where the batsman has faced at least 10 balls. Table 5 outlines the points based on strike rate.

**Table 5.** Points for strike rate.

Strike rate	Points	Strike rate	Points
Less than 50	0	151-175	4
51-75	1	176-200	5
76-100	2	201-300	6
101-150	3	Greater than 300	7

To differentiate between debut players and experienced players, we consider the total number of matches played. A debutant needs time to adapt to international standards, pitch conditions, and high-quality bowlers. Table 6 assigns points based on the total number of matches played.

**Table 6.** Points for total matches.

Matches	Points	Matches	Points
Less than 30	5	201-300	2
31-100	4	301-400	1
101-200	3	Greater than 400	0

Next, the quality of the opponent's bowling attack is assessed. A batsman scoring runs against part-time bowlers should not be rated the same as one scoring against experienced bowlers. The opponent's bowling quality is measured using economy rate and experience, as shown in Table 7.

**Table 7.** Points based on opponent bowler.

Matches	Economy Less than 6	Economy 6.01 to 7	Economy 7.01 to 8	Economy Greater than 8
Less than 30	1	0	0	0
31-50	2	1	0	0
51-100	3	2	1	0
100-300	4	3	2	1
Greater than 300	5	4	3	2

The pitch conditions also play a significant role. Runs scored in challenging conditions should be valued higher than runs scored in batting-friendly conditions. Additional points are awarded based on the average score at a venue, as shown in Table 8.

**Table 8.** Points based on pitch average score.

Average Score	Points	Average Score	Points
Greater than 270	0	211-250	2
251-270	1	Less than 211	3

In addition to all the above parameters, there are a few general parameters that need to be considered. A batsman who is batting first will play under less pressure compared to a batsman who is chasing a target. Hence, we cannot allocate the same points for both scenarios. Similarly, a player who is the captain has additional responsibilities, such as strategizing the batting order, managing bowlers, and making crucial decisions, which warrant extra points. Likewise, a batsman who remains on the field for the entire bowling innings deserves more points than one who spends time off the field during the bowling innings. Lastly, the Decision Review System (DRS) also plays a crucial role. While it may seem unusual to allocate points for DRS usage, a well-judged review can significantly impact the team's performance. A prime example is from the 2011 ICC Cricket World Cup, where Virender Sehwag was given out LBW by the on-field umpire. Without any discussion with the non-striker, Sehwag immediately challenged the decision. Discussion is not necessary when a striking batsman got inside edge. While such an instinctive review is justified in clear cases, in all other situations, a discussion with the non-striker is essential to avoid wasting reviews. Misuse of DRS can negatively affect the entire team, and hence, points for DRS decisions are allocated accordingly. The detailed point distribution for these general parameters is provided in Table 9.

**Table 9.** Points for few General Parameters.

Parameters	Points
First batting	No points
Chasing	5
For Captain	10
For Vice Captain	5
On field (inside ground) for entire bowling innings*	5
On field (inside ground) for 90 to 100 % entire bowling innings*	2
On field (inside ground) for less than 90 % entire bowling innings*	0
Reversed DRS	10
Retained DRS	5
Lost DRS (after discussion with non-striker batsman)	-1
Lost DRS (without discussion with non-striker batsman)	-10

\* Denotes a batsman who scored a minimum of 50 runs.

### 3. Bowler

#### A ODI Matches

First, we will calculate the points for bowlers based on their performance. For opening bowlers, points are allocated according to the number of wickets taken, as shown in Table 10.

**Table 10.** Points with respect to wickets obtained in a match.

Wicket(s)	Points	Wickets	Points
1	10	6	140
2	20	7	200
3	40	8	260
4	60	9	320
5	100	10	400

After considering the number of wickets taken, it is important to evaluate which batsmen the bowler has dismissed. Dismissing lower-order batsmen (typically bowlers) is relatively easier than breaking through the top order. Assigning equal points for all wickets does not accurately reflect a bowler's impact. Therefore, different points are assigned based on the order of the wicket, as detailed in Table 11.

**Table 11.** Points for wicket order in an innings.

Wicket	Points	Wicket	Points	Wicket	Points
1 <sup>st</sup>	70	4 <sup>th</sup>	60	7 <sup>th</sup>	40
2 <sup>nd</sup>	70	5 <sup>th</sup>	50	8 <sup>th</sup>	40
3 <sup>rd</sup>	70	6 <sup>th</sup>	50	9 <sup>th</sup> & 10 <sup>th</sup>	20

Next, the bowler's economy rate must be considered, calculated for a minimum of two overs. The points awarded based on economy rate are provided in Table 12.

**Table 12.** Points for economy rate.

Economy rate	Points	Economy rate	Points
Less than 1	50	4-5	25
1-2	45	5-6	20
2-3	40	6-8	10
3-4	30	Greater than 8	0

Another crucial factor is the bowler's role at different stages of the innings. Bowling during powerplay overs and death overs requires greater accuracy and strategic planning due to fielding restrictions and high-pressure situations. As a result, points for each over bowled in these phases are given separately, as listed in Table 13.

**Table 13.** Points for Each Over.

Overs	Points	Score	Points
Powerplay	2	40-45	4
35-40	3	45- 50	5

To differentiate debut players from experienced ones, their total number of matches played is considered. A debut player needs time to adapt to international standards, pitch conditions, and opposition strategies. Expecting them to perform at their peak immediately is unrealistic. Therefore, points based on total matches played are assigned as shown in Table 14.

**Table 14.** Points for total matches.

Matches	Points	Matches	Points
Less than 30	5	201-300	2
31-100	4	301-400	1
101-200	3	Greater than 400	0

Next, the quality of the opposition batsmen must be assessed. It is important to evaluate which batsmen a bowler dismisses or concedes runs against. Bowling well against a lower-order batsman is not as impactful as dismissing a top-order player. Instead of considering total runs scored by a batsman, we focus on their batting average. The points for a bowler's wicket based on the opponent's batting average are outlined in Table 15.



**Table 15.** Points based on opponent batsman batting average.

Matches	Average Less than 30	Average 30 to 35	Average 35 to 40	Average 40 to 45	Average 45 to 50	Average Greater than 50
Less than 30	1	2	3	4	5	6
31-50	7	8	9	10	11	12
51-100	13	14	15	16	17	18
100-300	19	20	21	22	23	24
Greater than 300	25	26	27	28	29	30

Pitch conditions also influence a bowler's performance. If a bowler takes at least one wicket in an innings, additional points are awarded based on the pitch's average score, as shown in Table 16.

**Table 16.** Points based on pitch average score.

Average Score	Points	Average Score	Points
Greater than 270	5	211-250	3
251-270	4	Less than 211	2

In addition to all the above factors, several general parameters must be considered. A bowler who bowls in the first innings faces less pressure compared to one bowling in the second innings when the opposition is chasing a target. Therefore, different points are awarded based on the innings in which the bowler delivers. Similarly, a captain has additional responsibilities, such as strategizing bowling rotations and identifying key opposition batsmen, making their performance more critical. As a result, captains and vice-captains receive extra points.

Additionally, a bowler who remains on the field for the entire bowling innings deserves more points than one who spends time off the field. Lastly, bowlers influencing the captain's decision to use the Decision Review System (DRS) also play a crucial role. Correctly reversed reviews can significantly impact the match, while wasted reviews can be detrimental. The general points for bowlers are listed in Table 17.

**Table 17.** Points for few General Parameters.

Parameters	Points
Bowling in First innings of the match	No points
Bowling in Second innings of the match	5
For Captain	10
For Vice Captain	5
On field (inside ground) for entire bowling innings*	5
On field (inside ground) for 90 to 100 % entire bowling innings*	2
On field (inside ground) for less than 90 % entire bowling innings*	0
Reversed DRS	10
Retained DRS	5
Lost DRS (after discussion with wicket keeper)	-1
Lost DRS (without discussion with wicket keeper)	-10

\* Denotes a bowler who bowled a minimum of 8 overs.

## 4. Catcher

### A. ODI MATCHES

When evaluating catches, it is impractical to assign points based on how spectacular a catch appears. Instead, points should be awarded based on the fielder's position and the over in which the catch is taken. While a slip fielder may have more catching opportunities, a player positioned near

the boundary—who prevents crucial runs for the team—might not have the same chances to take catches. This does not mean they are inferior fielders; in fact, players like AB de Villiers have been highly effective near the boundary, even with limited catching opportunities.

To ensure a fair assessment, points for catches are allocated according to specific fielding positions and match situations, as detailed in Table 18.

**Table 18.** Points for Catches.

Fielding Position	Overs	Points
Wicket Keeper	1-50	1
Slip	Powerplay	2
Boundary line	Non Powerplay	2
Slip	Non Powerplay	3
Boundary line	Powerplay	3
Inside 30-yard Circle*	1-50	4
Outside 30-yard Circle#	1-50	4

\*Other than wicket keeper and Slip position. #Other than Boundary line fielders.

5. Summary

Thus, analyzing players based on relative grading performance rather than cumulative grading performance provides a more accurate ranking of players. This ranking system allows for the identification of the best players globally. Similarly, this approach can also be extended to T20 and Test matches.

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