

Assist Quality Rating - A New Way to Track Assists

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Brief Overview

We wanted to deepen the “Assist” statistic in the NBA by considering the other variables in what makes a pass successful, rather than only the result of the ensuing shot.

“Assist Quality Rating,” or AQR is our result: a scale out of 100 applied to every pass that leads to a made basket which considers many factors such as pass distance, type of shot created, directness, and finishing difficulty.



Variables Explained

VARIABLE	PassDifficulty	ShotQuality Created	Directness of Assist	FinishingDifficultyAdjustment
DESCRIPTION	How difficult the pass is.	Where the recipient takes the shot on the court.	Type of pass.	How much extra effort the shot taker had to put into their shot.
METRICS	Pass distance Pass speed	Recipient's shooting percentage at that spot League average of created shot	Hand off Chest pass Bounce pass No look Heave	Amount of time shot taker had the ball in their hands after the assist Distance travelled after assist by scoring player



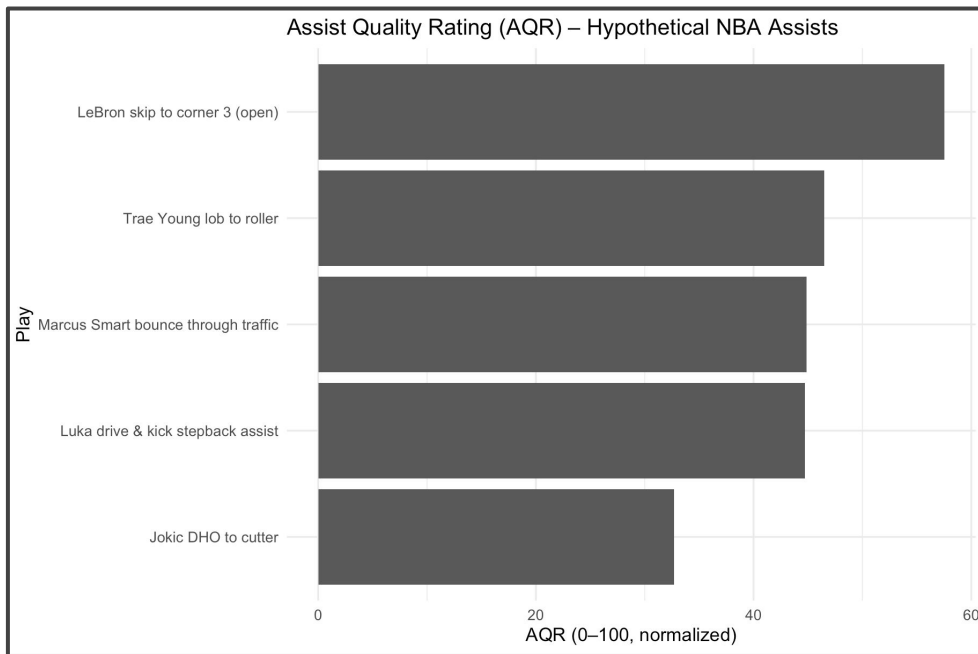
Formula

$$\text{AQR} = W1 * \text{PassDifficulty} + W2 * \text{ShotQualityCreated} + W3 * \text{Directness of Assist} + W4 * \text{FinishingDifficultyAdjustment}$$

$$W1 = 0.35, W2 = 0.40, W3 = 0.15, W4 = \pm 0.10$$



Results



```
# A tibble: 5 × 14
  Play      pass_distance_ft pass_speed_mph player_spot_pct league_created_pct
  <chr>      <dbl>          <dbl>          <dbl>          <dbl>
1 LeBron skip_ 35            30            0.42            0.36
2 Trae Young _ 12            18            0.65            0.6
3 Jokic DHO t_ 8             12            0.58            0.57
4 Marcus Smart_ 18           23            0.35            0.36
5 Luka drive _ 22           25            0.5            0.47
# i 9 more variables: pass_type <chr>, finish_time_secs <dbl>,
#   finish_distance_ft <dbl>, PassDifficulty <dbl>, ShotQualityCreated <dbl>,
#   DirectnessOfAssist <dbl>, FinishingDifficultyAdj <dbl>, AQR_raw <dbl>,
#   AQR <dbl>
>
```

Through our formula, hypothetical NBA scoring scenarios give an AQR that measures a **significantly more accurate rating of an assist**, rather than treating them all the same.



How NBA Teams Could Utilize AQR

- Creating better shots for players who struggle with creating space
- Isolating assist metrics to determine how good of a passer a given player is
- Drafting players that better cater towards certain parts of assists

This approach of breaking down a singular metric into many measurable qualities could also be applied to other statistics such as **rebounding, dribbling, and quantifying overall basketball IQ** for a given player.



Conclusion

- Captures context **traditionally invisible** in stats
- Sets foundation for integrating tracking data (SportVU / Second Spectrum) for **real-world applications**
- Redefining an assist within the NBA has **greater implications** for the future of the sport

“What is the next frontier of NBA Data Analytics?”

“Quantifying **chemistry, intelligence, and personality**” – Rick Carlisle



Thank You!