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MSDS 456
18 August 2025

Team Construction and Player Types

First, I wanted to determine how the Hawks stacked up the past two season against other teams in the league. To do this I used ISAR's basis of the four-factor model which includes effective field goal percentage (efg%), turnover percentage (TOV%), offensive rebound percentage (OREB%), and free-throw rate (FTR). Efg% is calculated by finding the ratio of made-field goals to total field goal attempts. TOV% is calculated by dividing the total number of turnovers by possessions, which for this project I used a possessions estimator, $\text{fga} + 0.44 * \text{fta} + \text{tov}$. OREB% is found using a simple calculation of a team's offensive rebounds divided by their offensive rebounds plus their opponent's defensive rebounds. Lastly, FTR is found by calculating the ratio of free throw attempts (fta) to field goal attempts (fga). I then calculated these four factors for the Hawks, both for the 2023-2024 season and 2024-2025 season, to see how they had either progressed or regressed in the last two years. I also calculated these factors for every team in the league and was able to build a ranking which allows for easier team comparison.

Below is a table showing the statistical value as well as NBA rank for each of the four factors for the Hawks 2023-2024 season. It can be seen that the Hawks were around league average in both efg%, TOV%, and FTR, while ranking 5th in offensive rebounding percentage. In this season two years ago, the Hawks made the play-in tournament but failed to reach the playoffs after falling to the Chicago Bulls in the 9/10 game.

Hawks — Four Factors (2023–24)

season	efg	tov_perc	ft	oreb_pct	rank_efg	rank_tov	rank_ft	rank_oreb
2023-2024	0.541	0.117	0.253	0.269	17	12	13	5

Last season, the Hawks took a step back in terms of their four-factor production, as seen below in the table, but oddly enough won more games than they did 2 seasons ago. They did rank in the top 10 in both free-throw rate and offensive rebound percentage but stayed stagnant in their effective field goal rate while turning the ball over at a much higher clip (12th in TOV% in 2023-2024 to 23rd in 2024-2025).

Hawks — Four Factors (2024–25)

season	efg	tov_perc	ftr	oreb_pct	rank_efg	rank_tov	rank_ftr	rank_oreb
2024-2025	0.548	0.132	0.256	0.261	17	23	8	10

Overall, the Hawks identity of being strong on the offensive glass and getting to the free throw line is apparent over the past two seasons, but their below average shooting efficiency and recent increased turnover rate is limiting their overall effectiveness. Addressing the low shooting percentage and high turnover rate should be priorities for the roster construction moving forward.

After finding how the Hawks graded out over the past two seasons, I wanted to extend the four-factor analysis by estimating the Hawks' expected wins for last season using a logistic regression framework. The model regressed potential game outcomes (wins = 1/0) based on the four factors:

$$\text{logit}(\text{Pr}(\text{Win})) = B0 + b1 * \text{eFG\%} + b2 * \text{Oreb\%} + B3 * \text{TOV\%} + B4 * \text{FTR}$$

For each game of the 2024-2025 season, the fitted probabilities were summed to obtain the Hawk's total expected wins for the season. The model estimated that the Hawks should've won 42.37 games, which is almost 2.5 games higher than their actual season total wins of 40. This means that based on the four-factor model I've created the Hawks underperformed relative

to their underlying four-factor efficiency. Explanations for the gap in expected versus actual wins could be explained by poor results in close games, variance in late-game execution, or matchup-specific issues that are not captured by the four-factor model.

Next, the front office asked me to find a new way to describe players and get rid of the standard position designations that they feel do not accurately reflect today's NBA. So, to move beyond the traditional labels, I applied clustering analysis to player-level data from the past 2 NBA seasons. Players were grouped using key performance metrics per 36 minutes – including scoring efficiency (eFG%, 3-pt rate, FTR), usage, playmaking (AST, TOV%), rebounding, defensive contributions (STL, BLK) and overall scoring output (PTS). By scaling these features and applying k-means clustering, I identified six distinct player types that more accurately represent the modern NBA player roles than the past position designations.

Player Type 1: Interior Stars / Two-Way Bigs

- **Key Traits:** Elite rim protection, high rebounding impact, efficient interior scoring
- 2nd in pts/36, 3rd in ast/36, 2nd in reb/36, 2nd in blk/36, 5th in 3-pt rate, 2nd in FTR, 2nd in usage
- **Representative Players:** Victor Wembanyama, Joel Embiid, Karl-Anthony Towns
- **Role:** Interior defense backbone, provides reliable scoring in the paint, versatile scoring

Player Type 2: Offensive Engines / Lead Guards

- **Key Traits:** High usage, elite scoring per 36, strong on-ball creation
- 1st in pts/36, 2nd in ast/36, 6th in tov/36, 4th in reb/36, 6th in blk/36, 3rd in FTR, 1st in usage
- **Representative Players:** Shai Gilgeous-Alexander, Luka Doncic, Anthony Edwards

- **Role:** Primary initiators and shot-creators; drive team offense through both scoring and playmaking

Player Type 3: Secondary Scorers / Offensive Wings

- **Key Traits:** Strong off-ball scoring, perimeter shooting, complementary playmaking
- 3rd in pts/36, 4th in ast/36, 1st in tov/36, 3rd in efg%, 1st in 3-pt rate, 6th in FTR, 4th in usage
- **Representative Players:** Klay Thompson, Michael Porter Jr., Donte DiVencenzo
- **Role:** Stretch defenses and provide secondary scoring threats from the perimeter without commanding the offense

Player Type 4: Finishing Bigs / Rim Protectors

- **Key Traits:** Efficient finishers around the rim, rim protection, offensive rebounding
- 4th in pts/36, 3rd in tov/36, 1st in reb/36 (1st in oreb/36 and 2nd in dreb/36), 1st in blk/36, 1st in efg%, 6th in 3-pt rate, 6th in usage
- **Representative Players:** Rudy Gobert, Andre Drummond, Ivica Zubac, Mark Williams
- **Role:** Bigs who thrive as pick-and-roll finishers and defensive anchors in the interior

Player Type 5: Versatile Forwards / Role Players

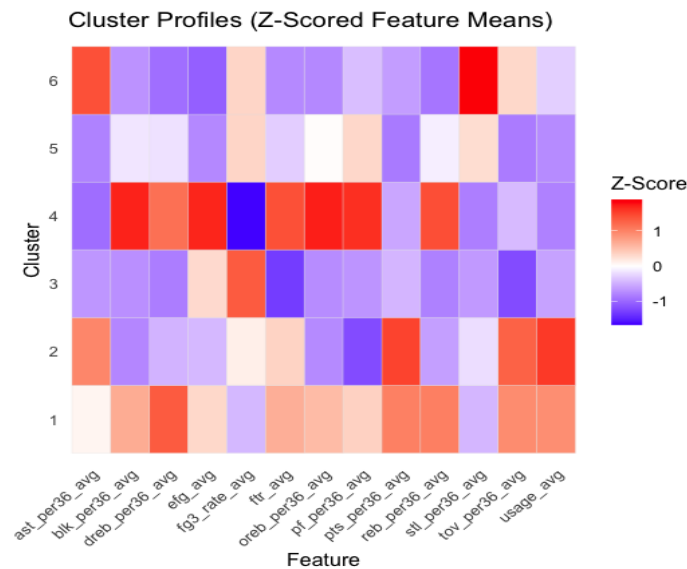
- **Key Traits:** Low scoring output, floor-spacing, multi-positional defense
- 6th in pts/36, 5th in ast/36, 3rd in reb/36, 3rd in stl/36, 3rd in blk/36, 5th in efg%, 5th in usage
- **Representative Players:** Andrew Wiggins, Naz Reid, Kelly Oubre Jr.
- **Role:** Fill lineup gaps with versatility and able to be switchable defensively

Player Type 6: Playmaking Guards / Connector Wings

- **Key Traits:** Moderate scoring, strong playmaking, able to run offense
- 5th in pts/36, 1st in ast/36, 4th in tov/36, 6th in reb/36, 1st in stl/36, 6th in efg%, 2nd in 3-pt rate, 3rd in usage

- **Representative Players:** Paul George, Deangelo Russel, Marcus Smart
- **Role:** Wings that are comfortable with the ball in their hands take a lot of threes (run offensively on the wings)

Below is a cluster profile table that took z-scores of each feature's means. This table allowed me to identify what each cluster excelled in, what they were proficient in, and how their 'player type' plays.



Now that the framework for redescribing players is built, we should apply it to the Hawks' roster to see how they stack up by player type and how they can increase the overall balance of their team.

- Player Type 1: Two-Way Big
 - *Jalen Johnson* – hybrid forward with a strong rebounding/scoring balance
- Player Type 2: Offensive Engine
 - *Trae Young* – primary ball handler and offensive creator, elite playmaker

- *De'Andre Hunter* – A wing scorer with the second most usage behind young, less efficient however
- Player Type 3: Secondary Scorers / Offensive Wings
 - *Zaccharie Risacher* – 4th highest 3-pt rate on the team, solid scorer with high usage
 - *Vit Krejci* – 2nd highest 3-pt rate on team, middle of pack in assists and steals
 - *Garrison Mathews, Caris LeVert, Terance Mann, Georges Niang, Bogdan Bogdanovic* – decent scorers with okay playmaking abilities, lower usage and lower minutes than the other two cluster 3 players
- Player Type 4: Finishing Bigs / Rim Protectors
 - *Onyeka Okongwu* – Better scorer and playmaker than his counterpart, has good offensive upside compared to mean stats within this cluster
 - *Clint Capela* – Fits this cluster more squarely, elite rebounder and rim protector, low usage and okay scorer
- Player Type 5: Versatile Forwards / Role Players
 - *Mouhamed Gueye* and *Larry Nance Jr.* – both had very low minutes, but are slightly below average forwards with great defensive stats, but low usage
- Player Type 6: Playmaking Guards
 - *Dyson Daniels*: Above average in assists, rebounds, steals, and usage. Does have 2nd most turnovers on team though suggesting he possess the ball a lot
 - *Keaton Wallace*

The guys with specific write-ups were in the top 8 of minutes played last season for the Hawks and I felt deserved to be discussed specifically.

Strengths

As the dispersion shows, the Hawks are well-stocked with Type 3 wings, which provides good spacing in the offensive zone and secondary scoring depth. However, these players usually lack on defense, which means an abundance of them could lead to a poor defensive team.

The Hawks also have two very solid Type 4 bigs in Okongwu and Capela, which reinforces their top 10 offensive rebounding percentage each of the last two years, and provides rim protection.

Trae Young is the team's offensive engine and they have a good replacement and even complement if needed with De'Andre Hunter behind him.

Weaknesses

The lineup consists of only one clear Type 1 Two-Way big in Jalen Johnson. This could mean that the Hawks lack consist interior scoring. Though Capela and Okongwu get lots of rebounds, their low usage suggests that often their points will come from cleaning up the glass. On the other hand, a player like Joel Embiid or Victor Wembanyama in this cluster will create offense for themselves.

There are limited Type 6 connector wings on the current lineup. While Dyson Daniels looks to be a strong player within this cluster, the back-to-back years of high turnovers for the Hawks suggests they may need players other than Trae Young to consistently run the offense through (4.67 turnover/36 mins).

While Type 3 wings are needed in a strong, well-balanced roster, of the players in the lineup that met the minutes requirement, just shy of half were classified as Type 3. These are complementary players, and too many of on the same lineup could lead to too few players that are comfortable with the ball in their hands and able to run the offense.

Recommendations this offseason

Prioritize adding another Type 1, Two-Way Big to the roster – Jalen Johnson is only 23 and can definitely be a cornerstone of the Hawks' franchise for years to come, so adding a veteran Two-Way big, someone like Bobby Portis, could allow for a big that is able to run the floor, and let Johnson develop behind/with for a year or two.

Target a proven Type 6 Connector Wing – Ideally, the Hawks should look to add a big wing who can defend multiple positions, hit threes, and serve as a complementary playmaker to Trae Young, as this would complement his on-ball role and add lineup flexibility. A potential target could include Cameron Payne, who is proven in this role but also wouldn't cost a ton of money after he has revitalized his career within the past 4 seasons after a stint overseas.

Emphasize using some of the Type 3 Secondary Scorers as trade pieces – Since this archetype is already well-represented within the lineup, the Hawks should look to hold onto their first overall pick last year, Risacher as well as Krejci, but look to maybe move Terance Mann and Georges Niang from the roster for a more needed position type.