Unveiling NBA Impact: Beyond Popularity

By: Justin Sabia, Mason Guilford, and CJ Duff

Overview

- This data visualization project seeks to challenge the conventional wisdom surrounding player popularity and shed light on the true impact of NBA players. The project aims to provide a comprehensive and visually engaging platform for users to explore raw statistical data, specifically focusing on performance metrics of players. By diving into key performance indicators, the project seeks to debunk the myth that the most popular players are always the most impactful.

Motivation

- Many exceptional players often go unnoticed, underrated, and underpaid due to the overwhelming influence of media narratives and fan favoritism. The project seeks to empower users by offering them an analytical tool that enables them to draw their own conclusions, whether it be someone just getting into it, or a veteran NBA fan. By showcasing the overlooked brilliance of players who may not be in the spotlight, perceptions can be properly reshaped and a deeper appreciation for all that goes into the success of an NBA team can be fostered. Ultimately, we want there to be a more informed and nuanced discussion about player impact.

Related Work

- On the website Basketballnews.com there is an article titled “NBA Roundtable: How do you define the most valuable player?” that talks about the different ways people feel the Most Valuable Player should be given out. After reading through the article, I found that most people have a fairly similar opinion. A two-way matrix, individual performance in correlation with team success. Team success is represented simply by a W/L record, but how are players efficiency evaluated? Everyone assumes LeBron James is capable of being in the running, but why? Players who have had a great impact in a regular season like Chris Paul, Zach Lavine, and Karl Anthony Towns are often overshadowed.

Questions

- The most important question we are aiming to answer is: Who are the most impactful players in the NBA? Of course this is not the first question we had. We started off with questions like;
    - What is the breakdown in terms of how players are scoring?
    - How does longevity in the league affect player efficiency?
    - How has the evolution of 3pt shooting affected player performance?
- We went from basic questions like these to the overarching question regarding impact after analyzing the data. What we found from matching players up based on points,

turnovers, assists, and other stats was that the higher ranking players were not as expected. It got us to thinking deeper;

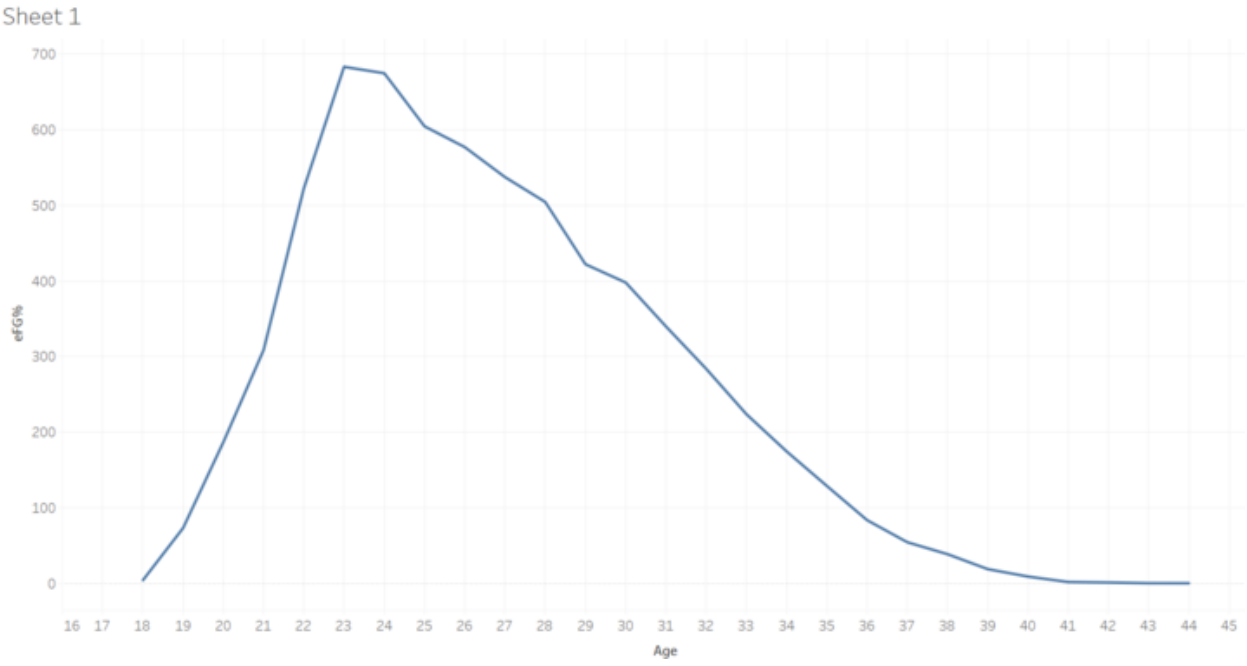
- How does possession protection relate to player efficiency?
- How does total points relate to player efficiency?
- Does the amount of field goals made adjust this player efficiency?

Data

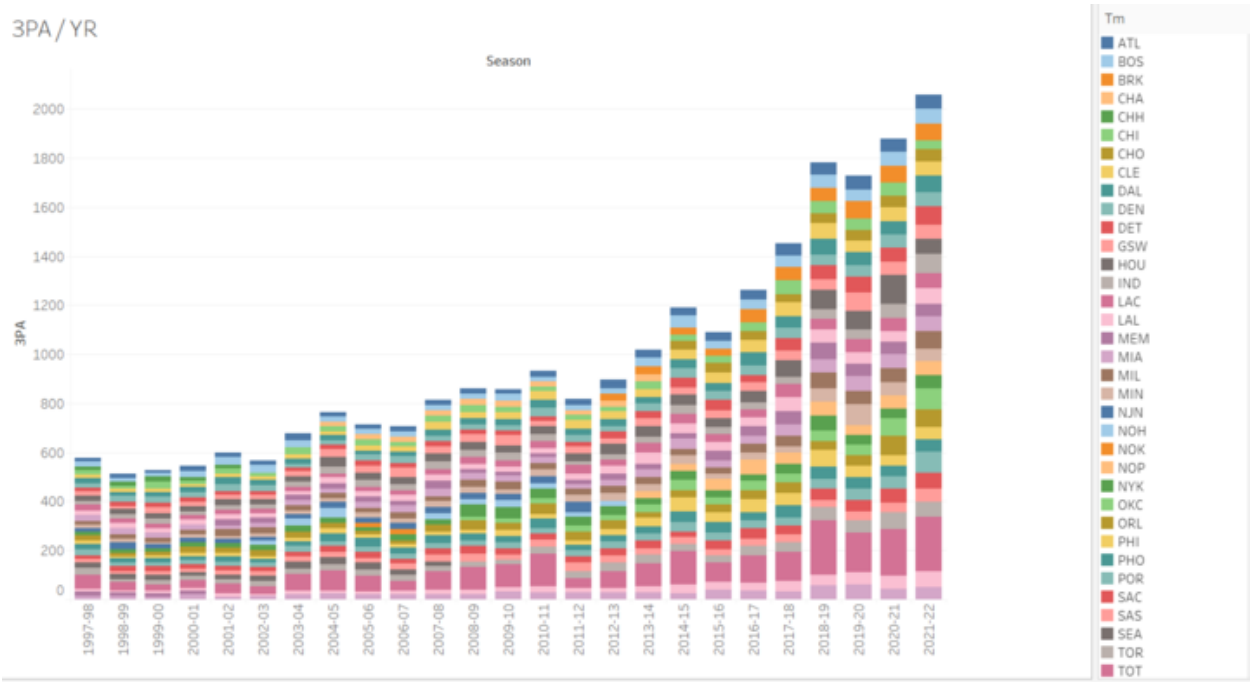
- Our original dataset consisted of NBA players stats per game from the 1997-98 season to the 2021-22 season. This data was collected from a well-respected basketball information source: www.basketball-reference.com.

Exploratory Data Analysis

- After locating and analyzing the dataset we chose to use, we started to make some simple visualizations to not only validate the data but provide ourselves with a better understanding of what the data was saying. We started with designs that showcased simple, everyday questions;



How does longevity in the league affect player performance? As expected a drastic decrease was represented.

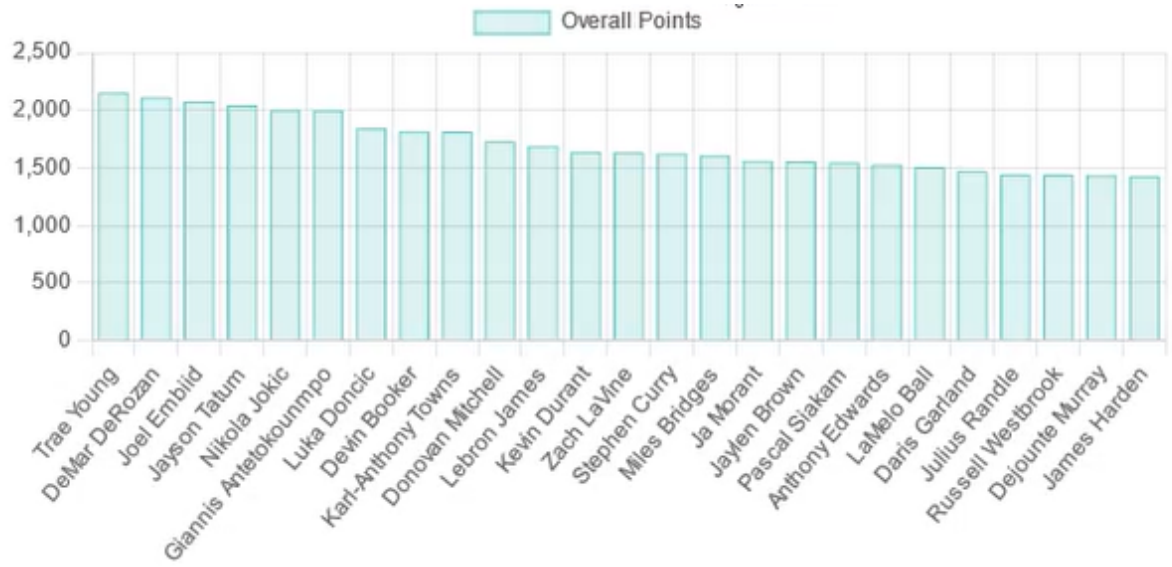


How has the evolution of 3PT shooting in the last decade affected player/team performance? Also as expected, it represented that teams have switched up their offensive philosophy to encourage more deep range shots. So we have started to see some validation of the dataset in terms of what we know to be true being accurately represented.

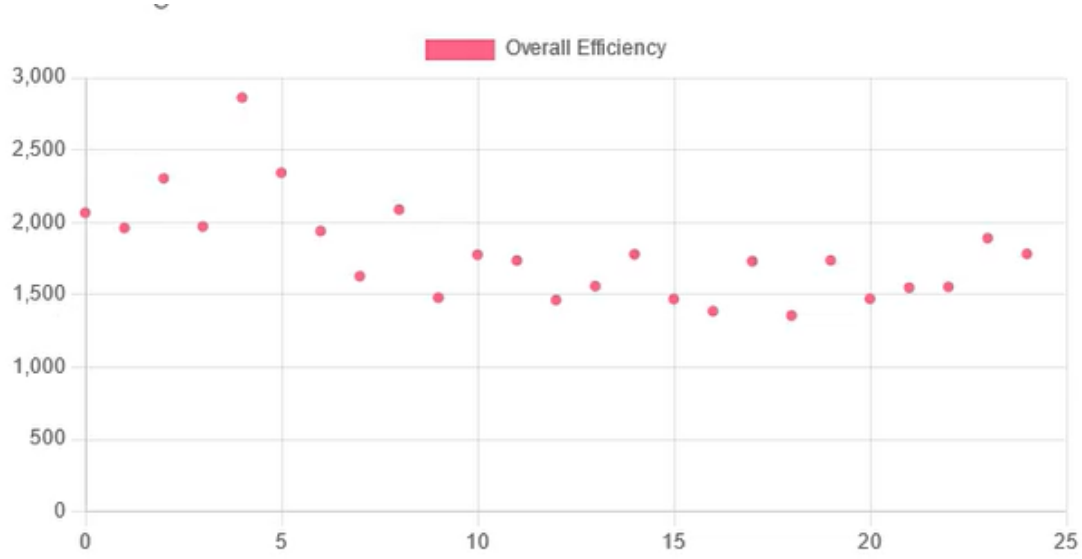
We then started diving into the realm of individual player impact and how efficient these players are when it comes to the performance metrics we decided on showcasing.

Design Evolution

- We decided that with the data we have, it presents us with an opportunity to give new and old fans a visually engaging and interactive experience to dive deeper into the complexity that goes into a player's success.



We started with a simple visualization showing the players with the most total points. Points is of course the most important stat when it comes to basketball, because ultimately that is what wins games. However, there is a lot more that goes into the efficiency of a player and we want to showcase that.



We then dove into a players overall efficiency which is calculated in the following manner:

Points + Rebounds + Assists + Blocks + Steals - Turnovers
Divided by Total Possessions
Multiplied by 100

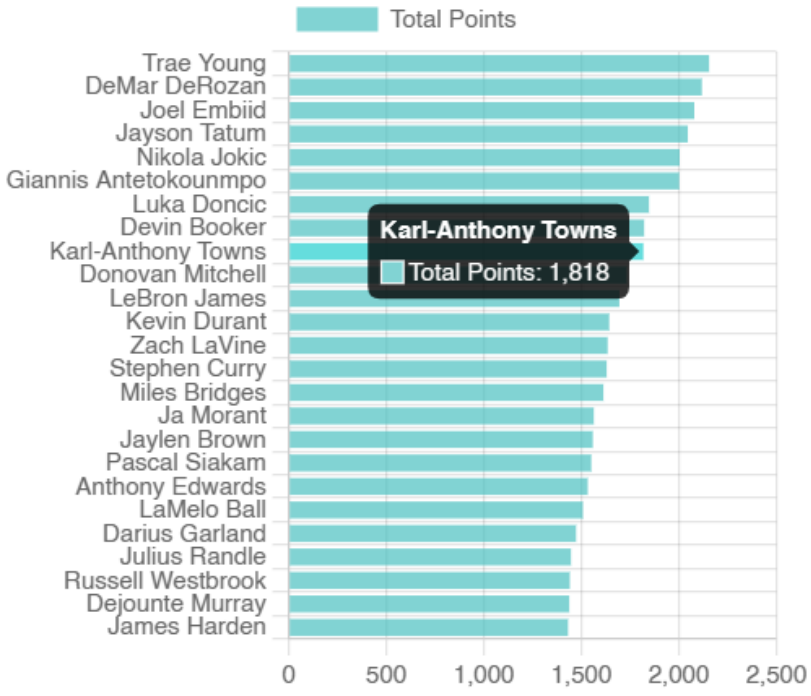
The higher the number, the higher the performance. This starts to provide a better understanding of how a player is performing when all aspects of the game are taken into account. Yet, we found we can take this same concept one step further.

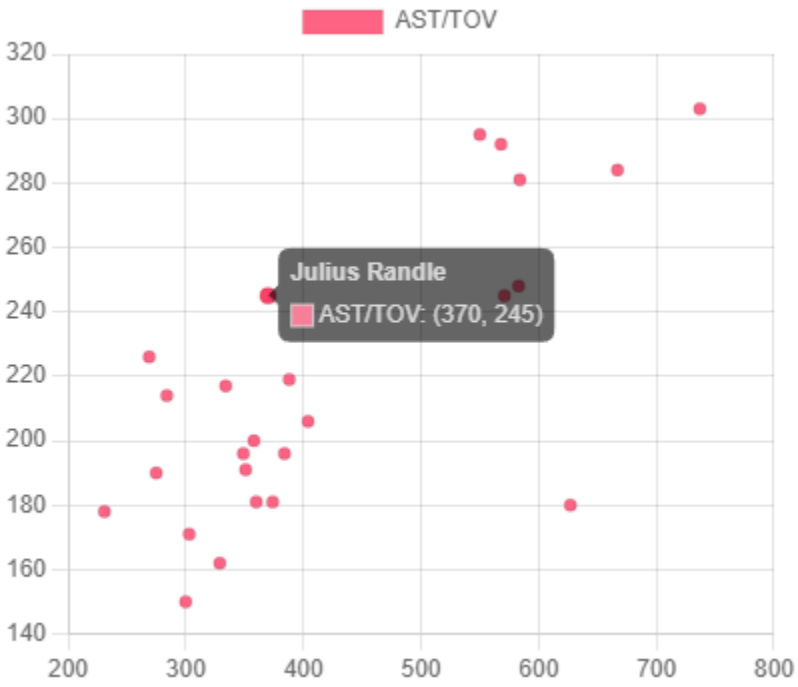
Player Efficiency Rating: A calculated formula created by John Hollinger of ESPN that weighs the individual statistics differently. This analysis assigns hierarchy when it comes to the amount of impact a certain aspect of basketball has. A good player efficiency rating indicates that a player is performing well on the court and is a valuable asset to their team.

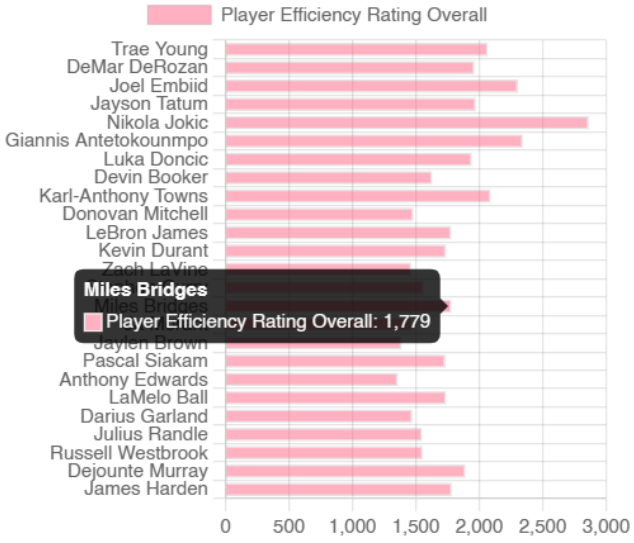
Implementation

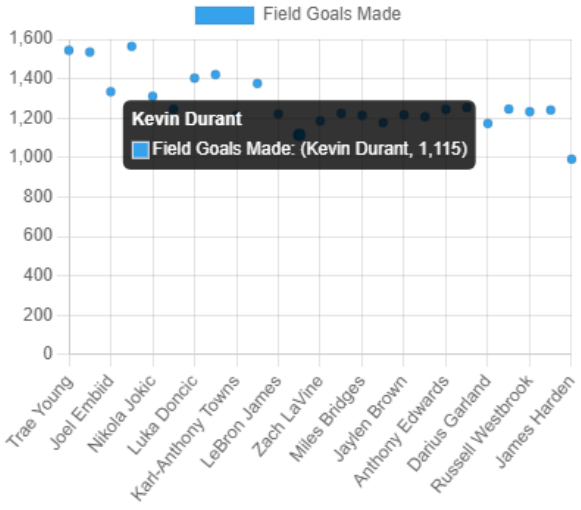
- To start we wanted to allow users to explore across multiple seasons, because as all things goes no player evaluation should be based on one variable, in this case a single season. If users start to notice that players are showing up more than once, or more importantly, only once, they will start to make conclusions regarding how impactful their career really is/was.

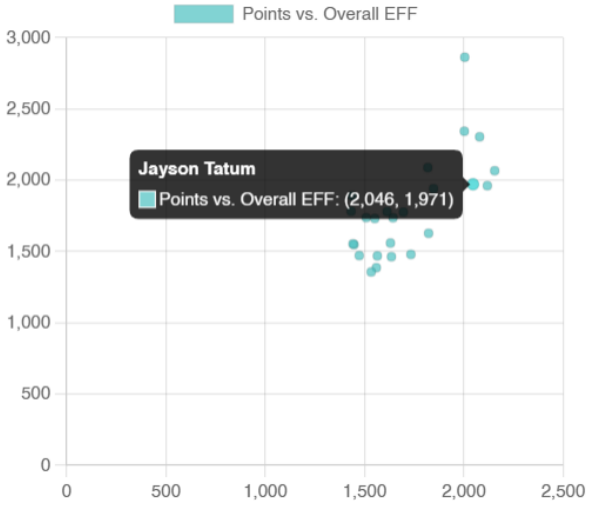
Here is the combination of visualizations we feel provides insight to the questions we are trying to address:






Player Efficiency Rating Overall
Trae Young
DeMar DeRozan
Joel Embiid
Jayson Tatum
Nikola Jokic
Giannis Antetokounmpo
Luka Doncic
Devin Booker
Karl-Anthony Towns
Donovan Mitchell
LeBron James
Kevin Durant
Miles Bridges
Player Efficiency Rating Overall: 1,779
Pascal Siakam
Anthony Edwards
LaMelo Ball
Darius Garland
Julius Randle
Russell Westbrook
Dejounte Murray
James Harden
0
500
1,000
1,500
2,000
2,500
3,000


Field Goals Made
1,600
1,400
1,200
1,000
800
600
400
200
0
Kevin Durant
Field Goals Made: (Kevin Durant, 1,115)
Trae Young
Joel Embiid
Nikola Jokic
Luka Doncic
Karl-Anthony Towns
LeBron James
Zach LaVine
Miles Bridges
Jaylen Brown
Anthony Edwards
Darius Garland
Russell Westbrook
James Harden


Points vs. Overall EFF
3,000
2,500
2,000
1,500
1,000
500
0
Jayson Tatum
Points vs. Overall EFF: (2,046, 1,971)
0
500
1,000
1,500
2,000
2,500

In our endeavor to communicate the efficiency of NBA players, we've strategically employed scatter plots and bar charts to offer users a user-friendly yet powerful interface for a grand overview of player performance. The primary objective is to empower users with the ability to easily compare the best players against each other, fostering a nuanced understanding of their performance metrics.

The scatterplots serve as an intuitive canvas, where each player is represented by a point on a graph. By following data points based on key efficiency metrics users can effortlessly discern patterns, trends, and outliers. Hovering over these data points provides users with the exact performance data, enabling a seamless comparison of different players. This proves invaluable when assessing how players stack up against one another, promoting a deeper exploration of their individual contributions. The bar charts accomplish a similar feat yet provide information in a more visually digestible format where we felt could benefit from it.

In recognizing the complexity inherent in analyzing NBA data, our approach to visualization is designed to be sophisticated yet approachable. We understand that the majority of our users may not be statisticians or basketball experts, so we've ensured that the visualizations strike a balance. Our commitment is to democratize the understanding of NBA player impact, making it insightful and accessible for a more broad audience. People will start to make conclusions of their own, and players who are not necessarily in the spotlight will start to get the recognition they deserve.

Evaluation

- Us as a group are a part of the demographic that we would say benefits the most from our visualizations. We are familiar with the sport, yet are in no way super fans. We know the big names like Lebron James, Stephen Curry, Kevin Durant, etc. But it asks the question: Why are those the names we know? Are they really the most impactful players? We learned as we hope our users learn, that players are not noticed the way they should be. Sophomore players like Anthony Edwards and Trae Young are making a huge impact for their teams at such a young age, yet they are still overshadowed by the players who came before them. The visualization works in a manner that provides 5 separate aspects that collaborate with one another to provide an overall representation of these players' impact. Given more time, we would have loved to potentially include visualizations that correlate to the amount of pay players are given, or even the amount of media coverage that players are given.