

PREMIER LEAGUE PLAYER DATA ANALYSIS

Descriptive, Diagnostic, Predictive & Prescriptive Insights

PROJECT OBJECTIVE & DATASET DESCRIPTION

- Dataset contains detailed statistics for all Premier League players.
- Total features: 57 columns covering offensive, defensive, and passing metrics.
- Each row represents a player.
- Objective: Apply all 4 types of analytics to extract actionable insights.



1.Descriptive

What happened?

2.Diagnostic

Why did it happen?

3.Predictive

What could happen?

4.Prescriptive

What should we do?

APPROACH IN ANALYSIS

Methodology

- Microsoft Excel – Calculated Fields, Charts, Trendlines
- Data cleaning & feature selection applied to reduce dimensionality.
- Filtered essential columns based on questions and use cases.
- Visualizations created for enhanced interpretability.



DESCRIPTIVE INSIGHTS



1.Univariate

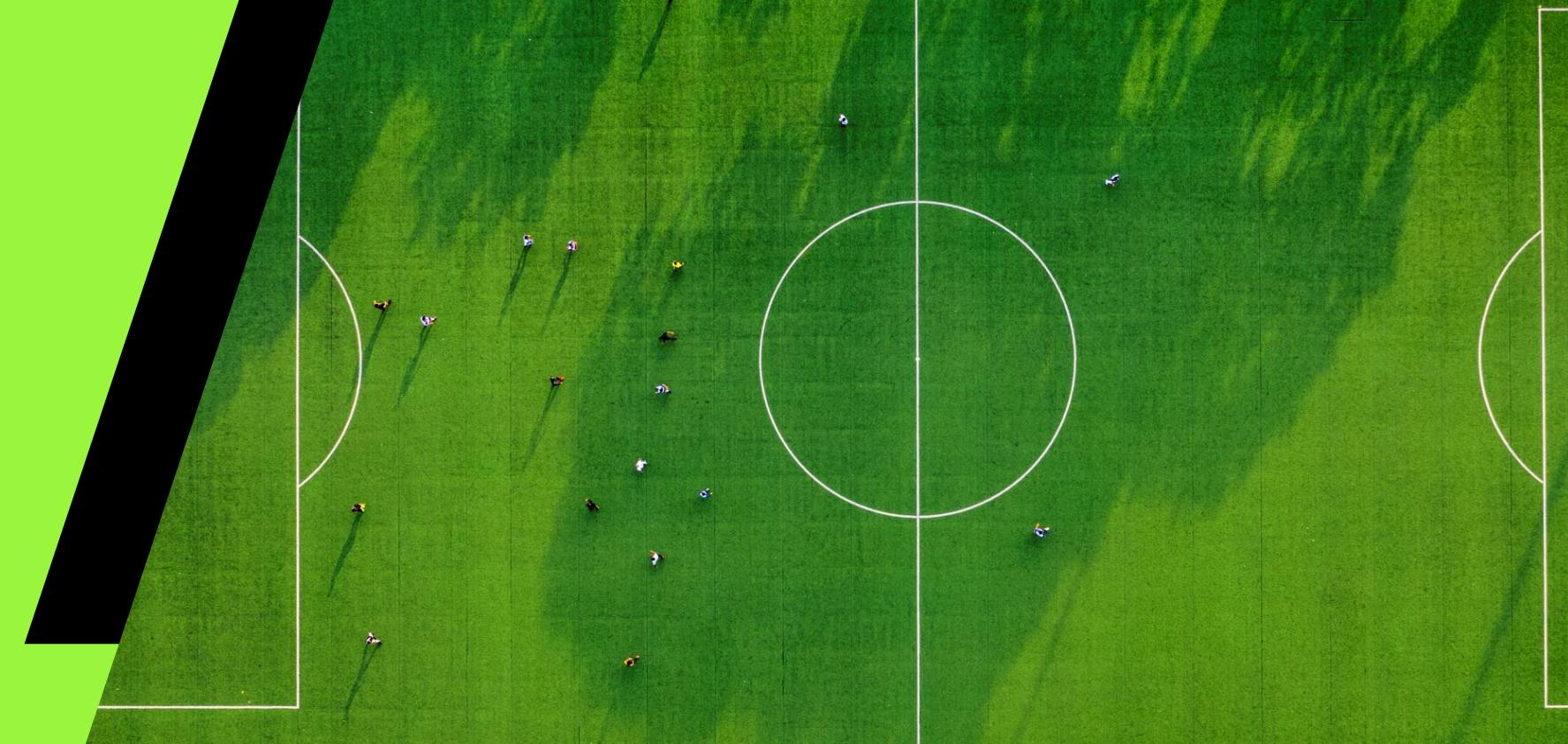
1. How many players are there in each position?
2. How many players have scored more than 5 goals?
3. Who are the top 10 players in terms of assists?
4. How many players have played more than 2000 minutes?
5. Who are the players with the most shots on target?
6. How many players have more than 10 clean sheets?

2.Bivariate

7. What is the average number of goals per nationality?
8. Which club's players have scored the most goals?
9. What is the overall goal distribution by position?
10. What is the pass completion rate (%) for each position?

The distribution of players by nationality

This pie chart show that the most common nationality in league is England

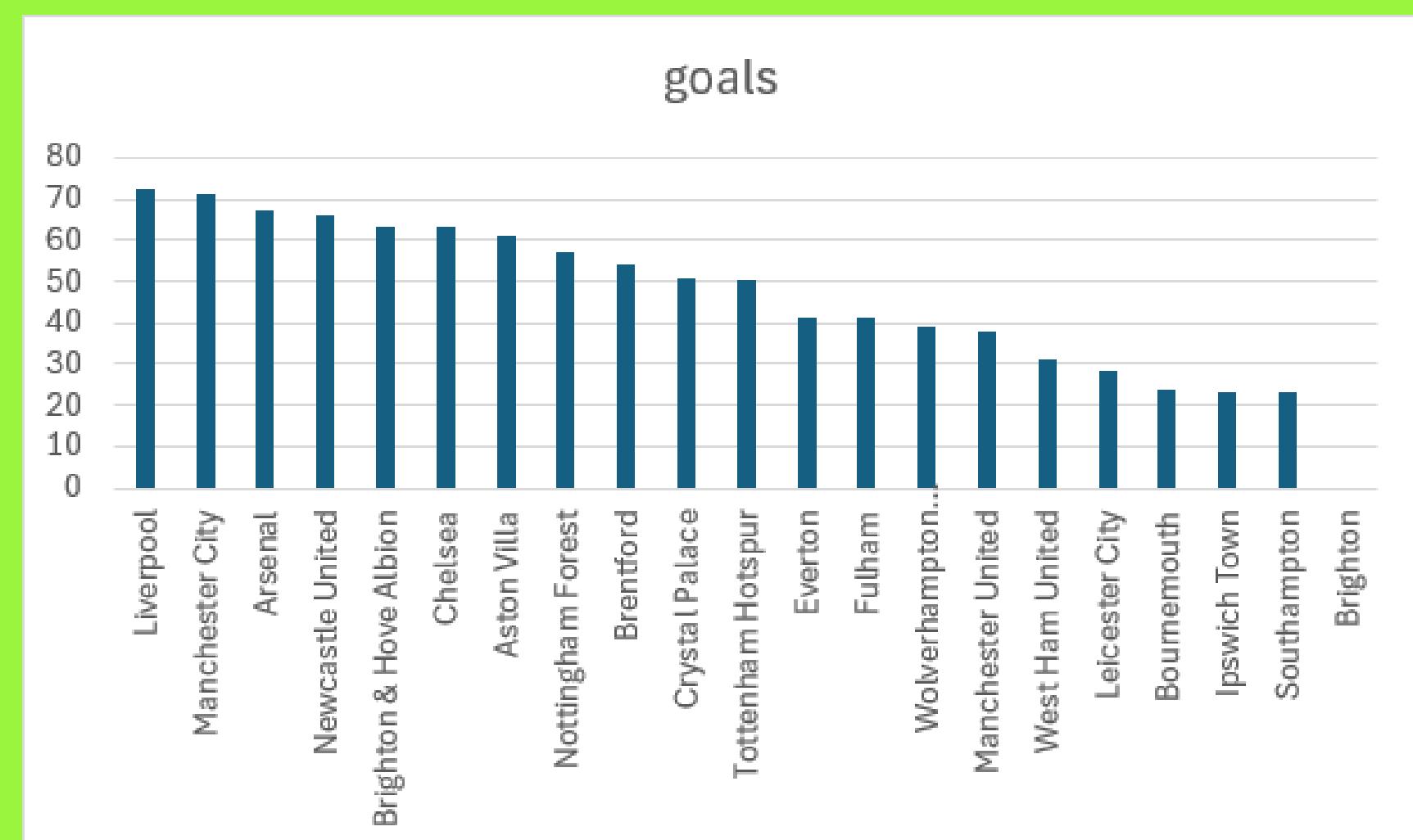


The distribution of goal by position

This pie chart show that the midfielders has more goals than forwards players



Which club's players have scored the most goals?



DESCRIPTIVE INSIGHTS

DIAGNOSTIC INSIGHTS

1.Bivariate

1. Is there a relationship between minutes played and number of goals?
2. Are final third passes correlated with assists?
3. Do players with more interceptions have weaker attacking ratings?
4. Does a player's position affect their pass completion percentage?
5. Is there a relationship between dispossessions and total passes?
6. Why do some goalkeepers have higher "Goals Prevented"? Is it linked to save attempts?
7. Why do some players have a low conversion rate despite taking many shots?

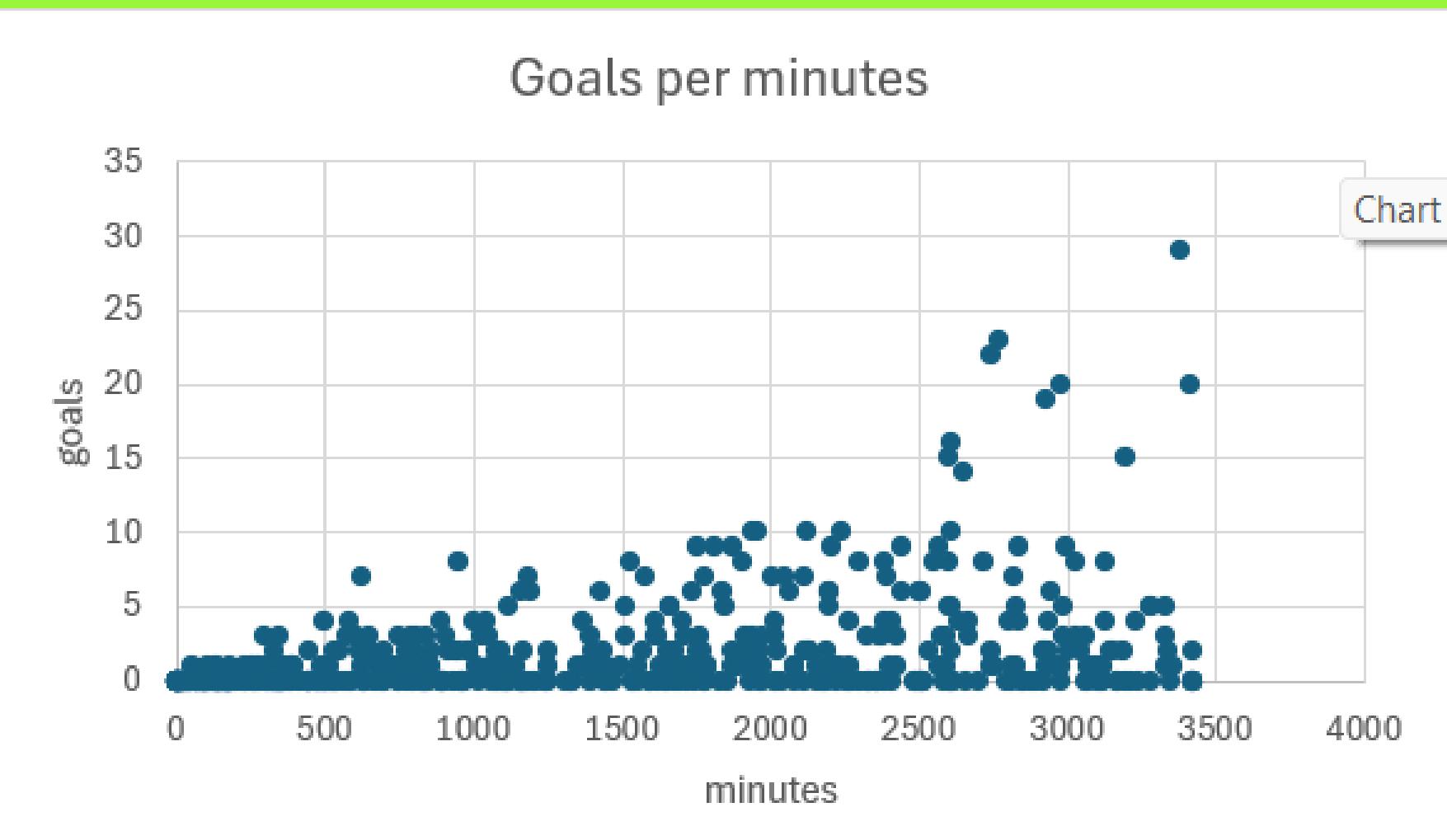
2.Multivariate

1. Why do some positions score more goals than others? Is it due to the number of shots?
2. Are tackles and interceptions related based on position?
3. Is there a relationship between progressive carries and successful dribbles or goals?



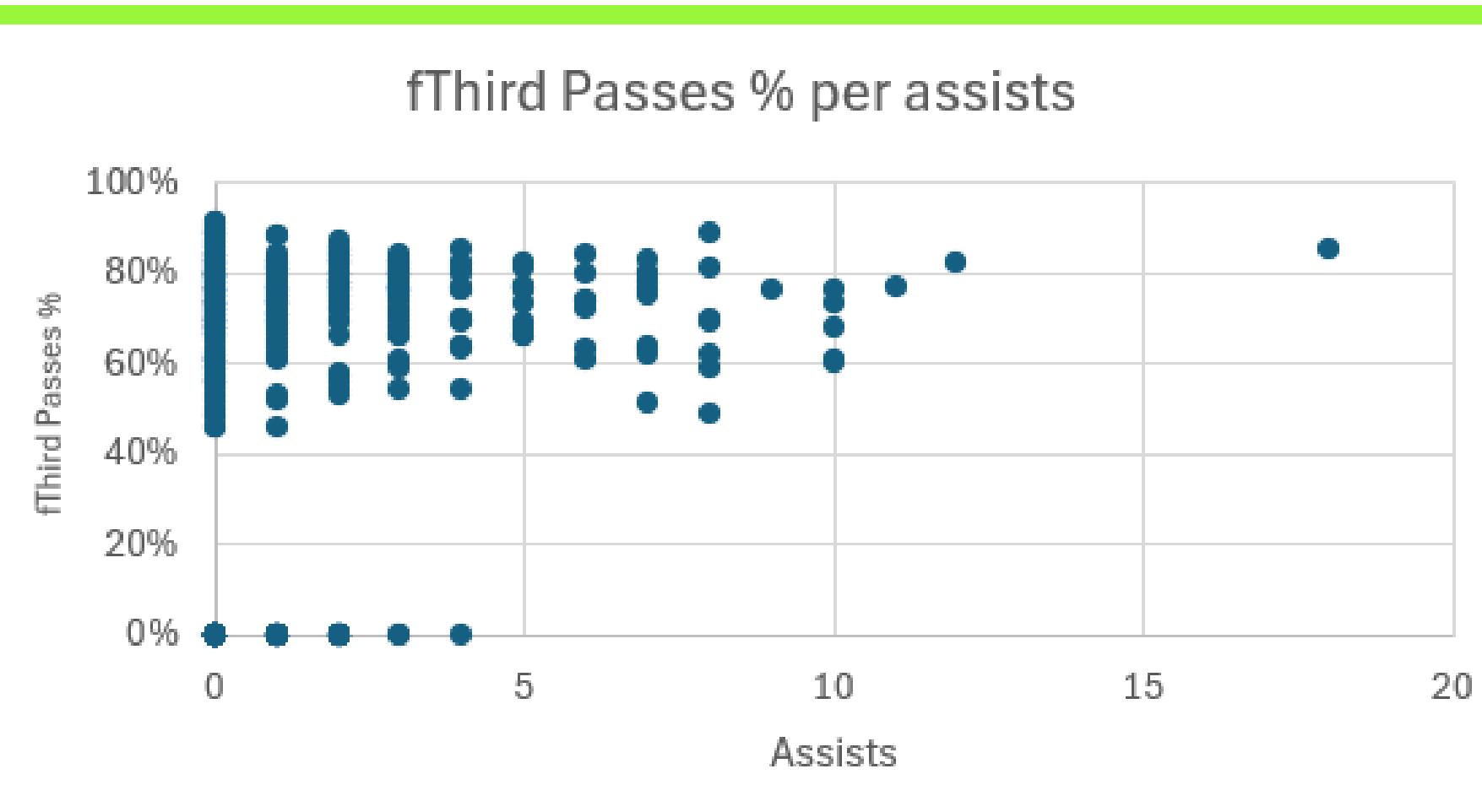
Is there a relationship between minutes played and number of goals?

As we see in the scatter chart there is one side relationship between goals and minutes played, as all top scorers had played more than 2500 minutes but not all players who played more than 2500 minutes are top scorers



Are final third passes correlated with assists?

It is the same conclusion in the goals chart as we see that all top assisters had high final third passes%, but not all players who had final third passes% are top assisters



Why do some players have a low conversion rate despite taking many shots?

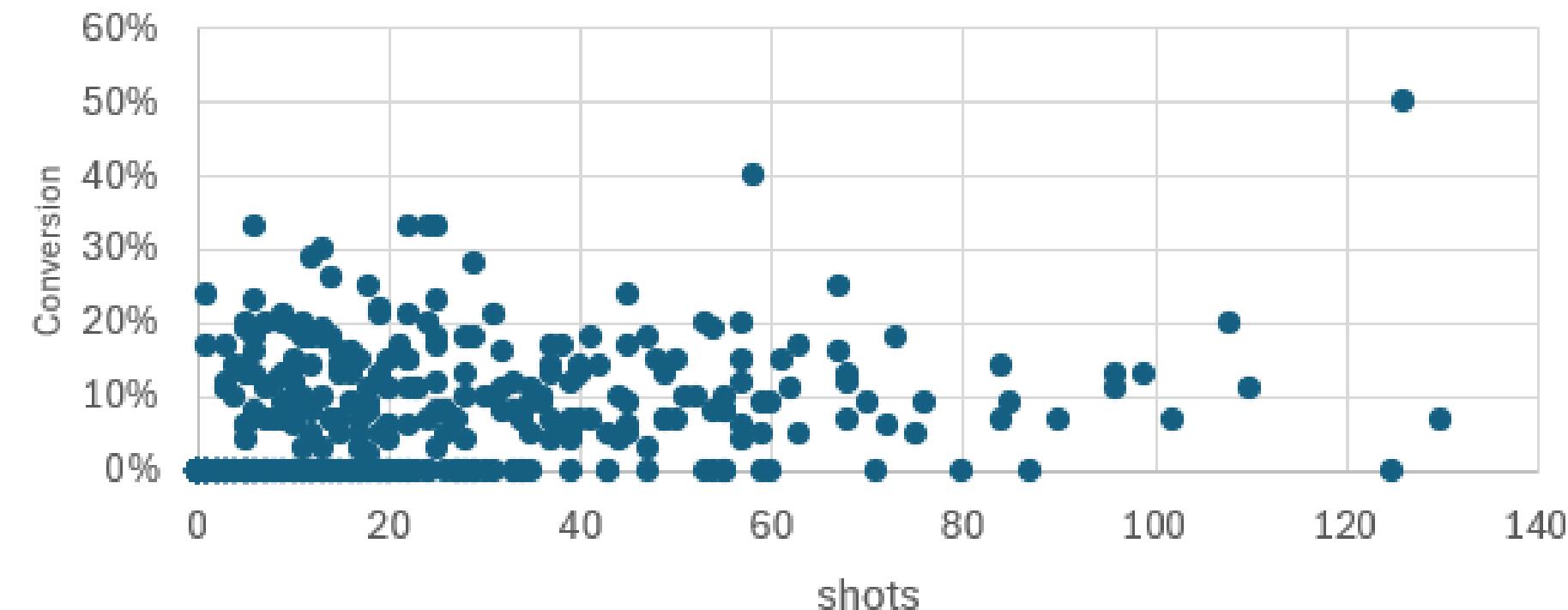
As we see in the scatter chart there is low average conversion rate, and this may happen because two reasons:

1. low quality of players shots and players should practice more
2. high quality of goalkeepers and defenders

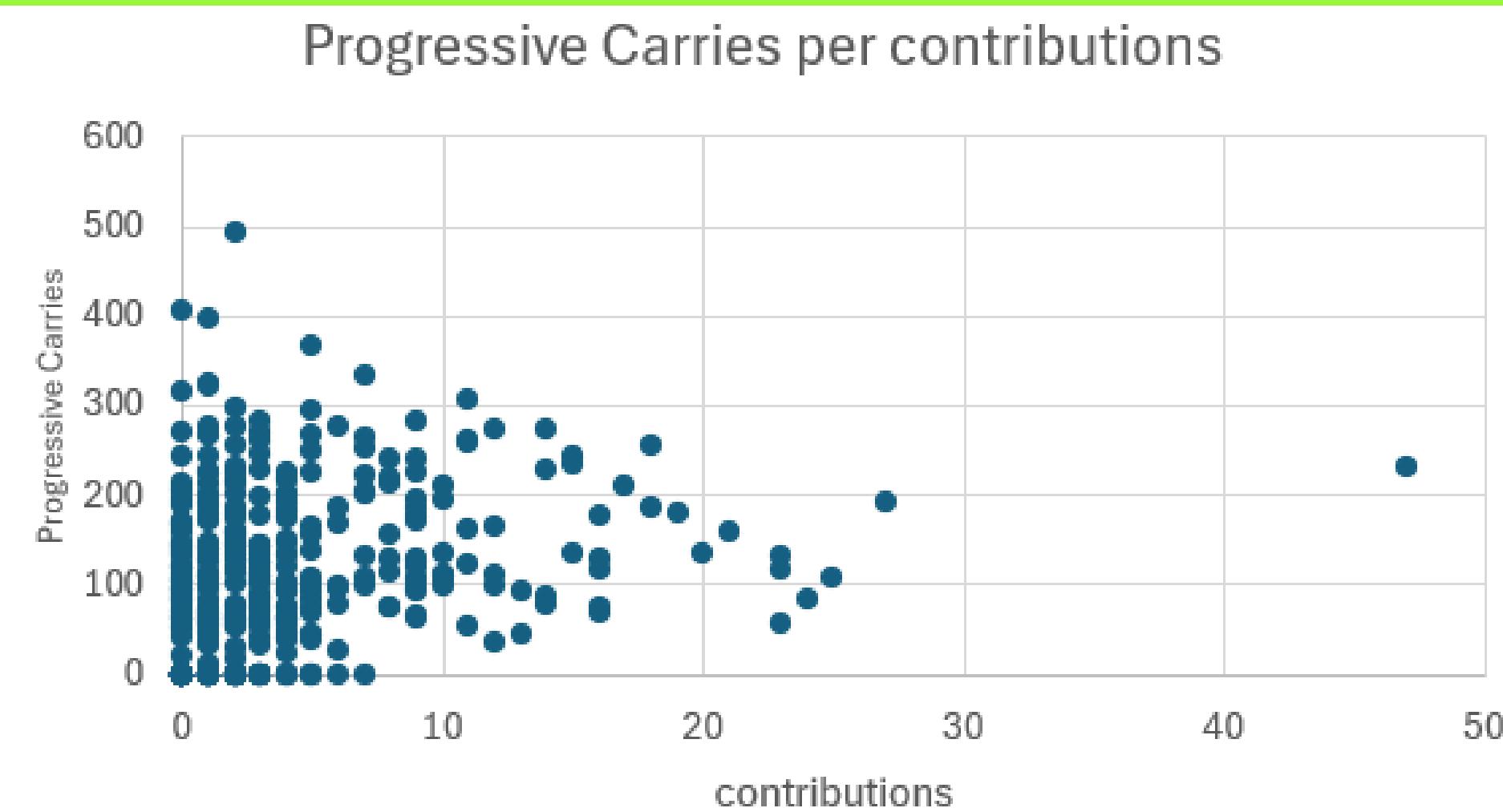
Is there a relationship between progressive carries and successful dribbles or goals?

As we see in scatter chart there is an inverse relationship between the progressive carries and offensive contribution so we can conclude that the player how make progressive carries usually doesn't contribute to goals

Conversion % per shots

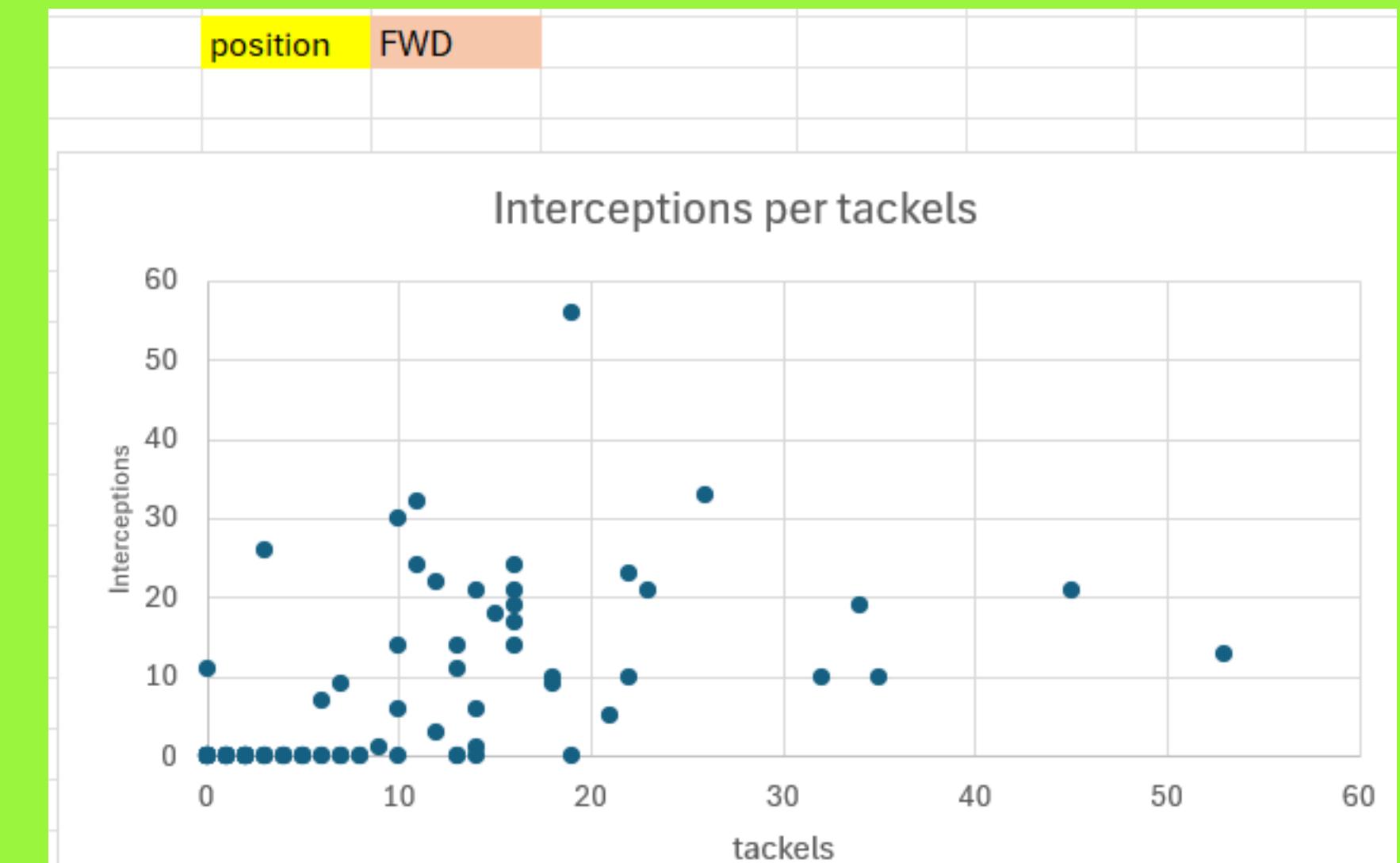
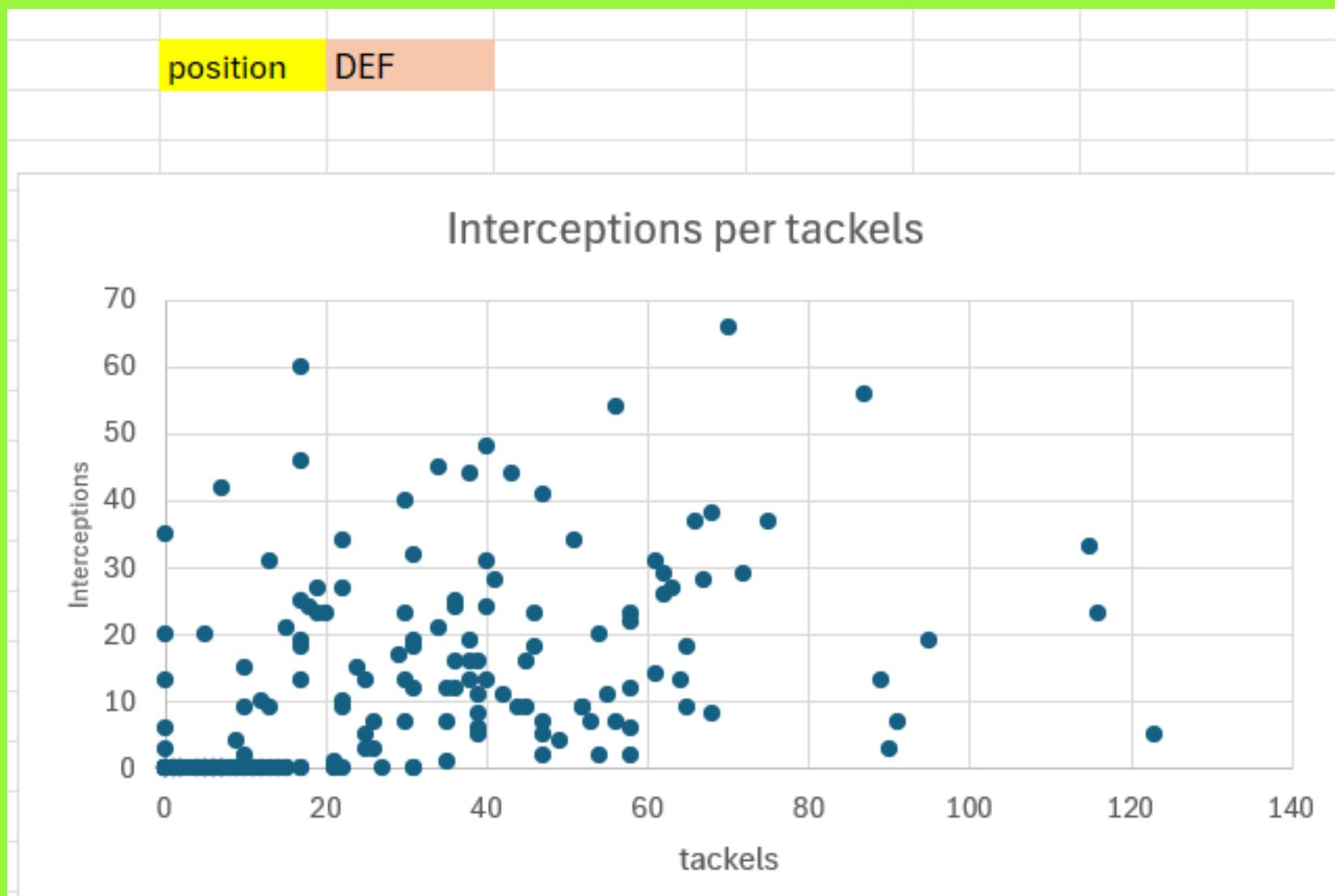


Progressive Carries per contributions



Are tackles and interceptions related based on position?

As we see in scatter chart the number of tackles and interceptions is more in DEF players than FWD players and also the number interception per tackles is more in DEF players as they are specialist in defending



PREDICTIVE MODELING & PROJECTIONS



2. Multivariate

1. The system simulates match results between two clubs
2. combined offensive contribution for an entire team across future matches
3. how team performance would drop if a key player is unavailable

1. Bivariate

1. which player in a selected club is most likely to score?
2. forecasts the number of goals and assists expected in the next 5 matches.
3. It predicts which bench players could have a strong impact if given more minutes

PREDICTIVE MODELING

which player in a selected club is most likely to score?

It predicts which bench players could have a strong impact if given more minutes

how team performance would drop if a key player is unavailable

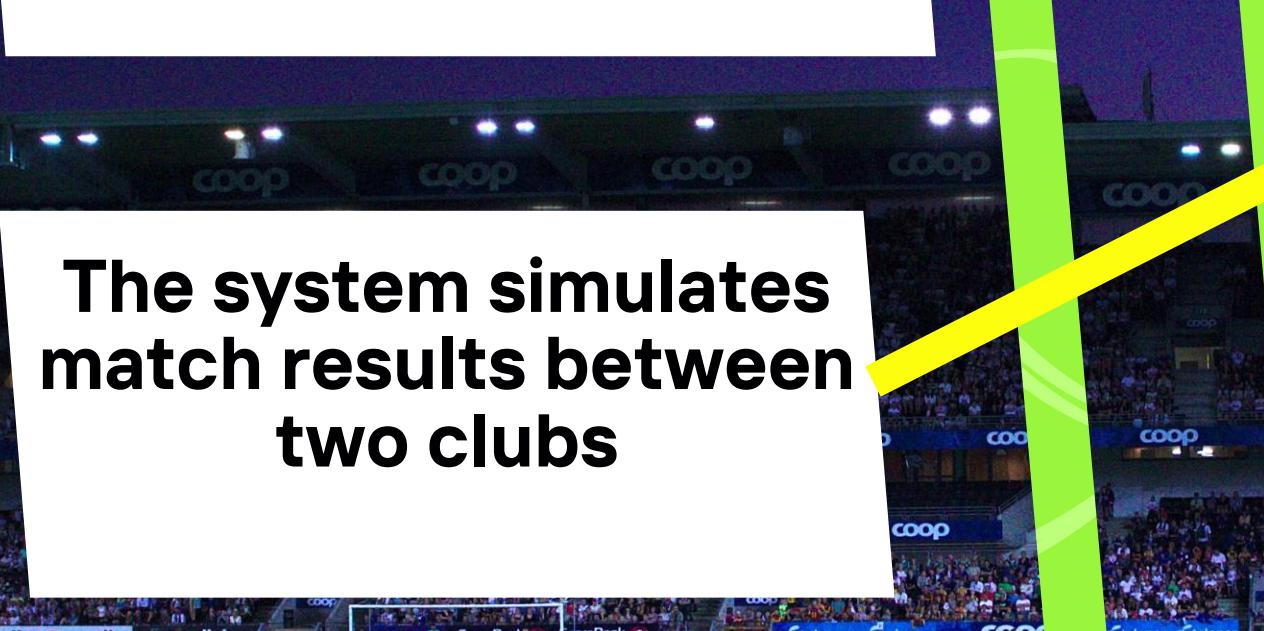
club	Liverpool	player	expected goals per 90 minutes	cumulative
		Mohamed Salah	0.77	0.77
		Cody Gakpo	0.46	1.24
		Diogo Jota	0.45	1.69
		Darwin Núñez	0.40	2.09
		Harvey Elliott	0.25	2.34
		Dominik Szoboszlai	0.22	2.56
		Alexis Mac Allister	0.17	2.73
		Curtis Jones	0.16	2.89
		Trent Alexander-Arnold	0.11	3.00
		Virgil van Dijk	0.08	3.08
		Ibrahima Konaté	0.04	3.12

This system will predict the number of goals expected for each player and so the number of goals expected per team in next matches by using the cumulative function

PROJECTIONS

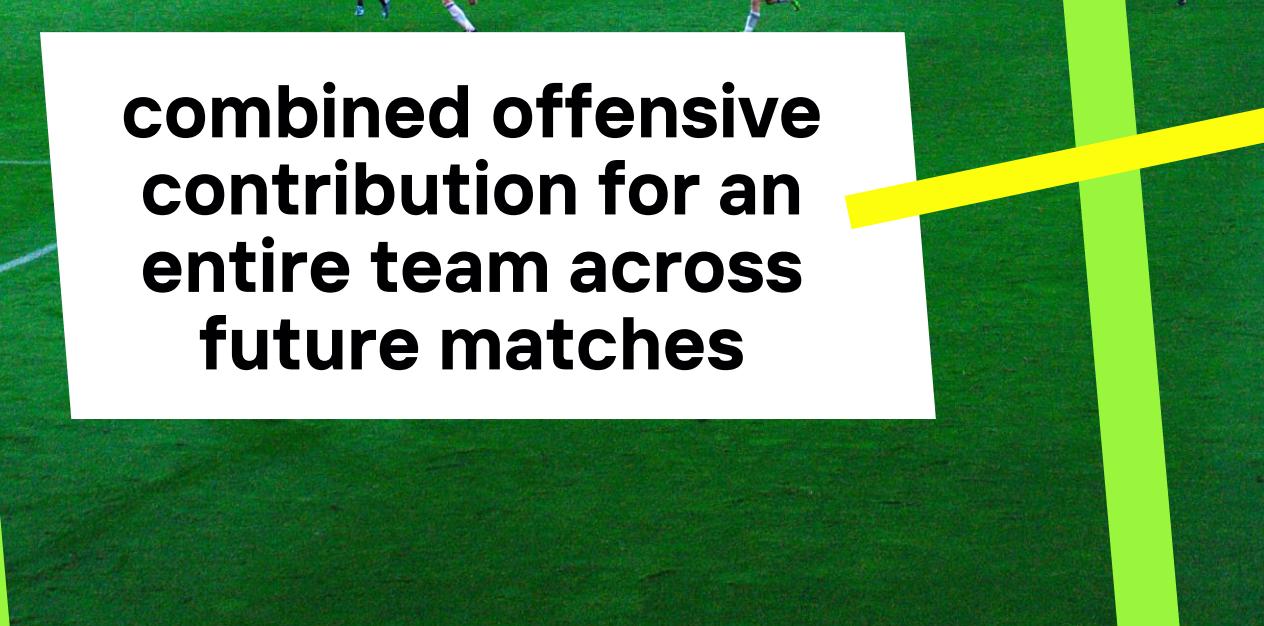
forecasts the number of goals and assists expected in the next 5 matches.

player	Mohamed Salah	expected goals next 5 matchs	3.86
		expected assists next 5 matchs	2.40

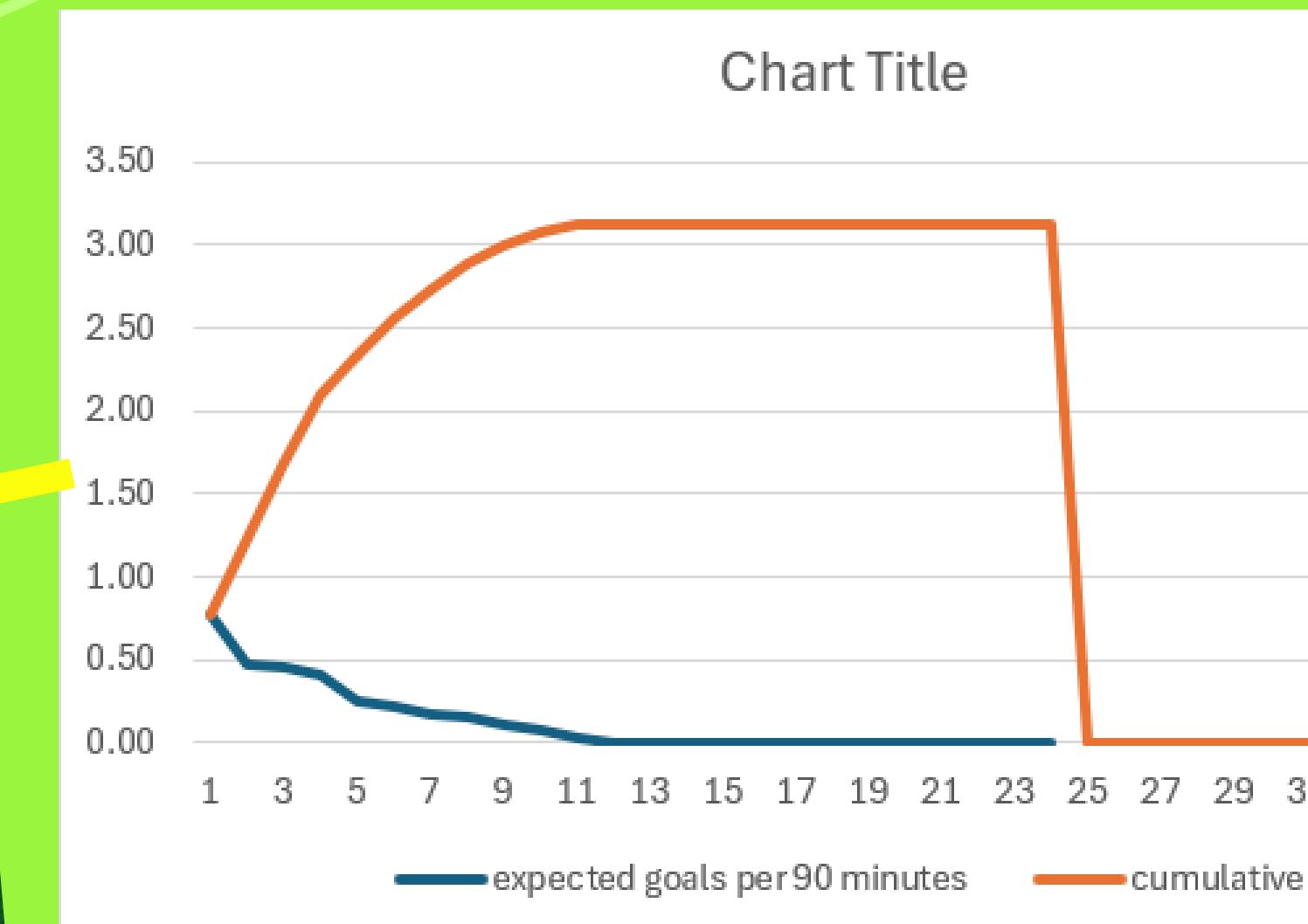


The system simulates match results between two clubs

Team 1	Manchester City	Team 2	Arsenal	Expected
				Team 1 is expected to win



combined offensive contribution for an entire team across future matches



This chart shows the expected goals per player in next match and the cumulative one shows the expected goals for team in next match

PREScriptive RECOMMENDATIONS

1.Bivariate

- The system recommends the best starting:

1. Goalkeeper based on total saves
2. Defenders based on total clean sheets
3. Central midfielders based on passing accuracy, key passes
4. Strikers based on expected goals
5. optimal lineups for any selected team



- The system recommends the best combination of players in each position from selected match



BIVARIATE RECOMMENDATIONS

- The system recommends the best optimal lineups for any selected team

Team 1	Team 2	FWD	Mohamed Salah	Cody Gakpo	Diogo Jota
Liverpool	Liverpool	MID	Alexis Mac Allister	Luis Díaz	Curtis Jones
		DEF	Virgil van Dijk	Ibrahima Konaté	Andy Robertson
		GKP	Alisson Becker		Trent Alexander-Arnold

- The system recommends the best mixed lineups from selected match

Team 1	Team 2	FWD	James McAtee	Erling Haaland	Omar Marmoush
Manchester City	Arsenal	MID	Martin Ødegaard	Wes Burns	Bukayo Saka
		DEF	William Saliba	Josko Gvardiol	Rúben Dias
		GKP	David Raya		Gabriel Magalhães

PRESCRIPTIVE RECOMMENDATIONS

2. Multivariate

- **Smart Scouting & Player Selection System**
 - In the final stage of the analysis, we developed a filter-based recommendation engine to assist:
 1. Clubs in scouting potential signings
 2. National teams in selecting optimal players for call-ups
 - The system allows filtering players by:
 1. Position
 2. Club
 3. Nationality
 - Then ranks them based on any selected performance metric such as: offensive contribution / pass% / clean sheet / saves



SMART SCOUTING & PLAYER SELECTION SYSTEM

Player Recommendation System		Player Recommendation System		
	Position	GKP	Position	MID
	Nationality	England	Nationality	Brazil
	Club	Total	Club	Total
	sort by	saves	sort by	offensive contributions
player	saves	player	offensive contributions	
Aaron Ramsdale	125	Matheus Cunha	21	
Jordan Pickford	122	Gabriel Martinelli	12	
Dean Henderson	104	Joelinton	7	
Nick Pope	88	Andreas Pereira	6	
Fraser Forster	29	Bruno Guimarães	5	
Alex McCarthy	24	Lucas Paquetá	4	
Sam Johnstone	23	Matheus França	1	
Christian Walton	20	Casemiro	1	
Joe Lumley	13			
Dan Bentley	8			

This enables coaches and scouts to make data-informed decisions when:

- Identifying high-potential targets
- Filling squad gaps
- Replacing underperforming players



THANK YOU

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