



Carmel Camilleri

# How Visualizations and Data are Used in Soccer



# Agenda

- Why European Soccer Is Amazing
- Simple Figures- Big Value
- Why should you care about data in sports



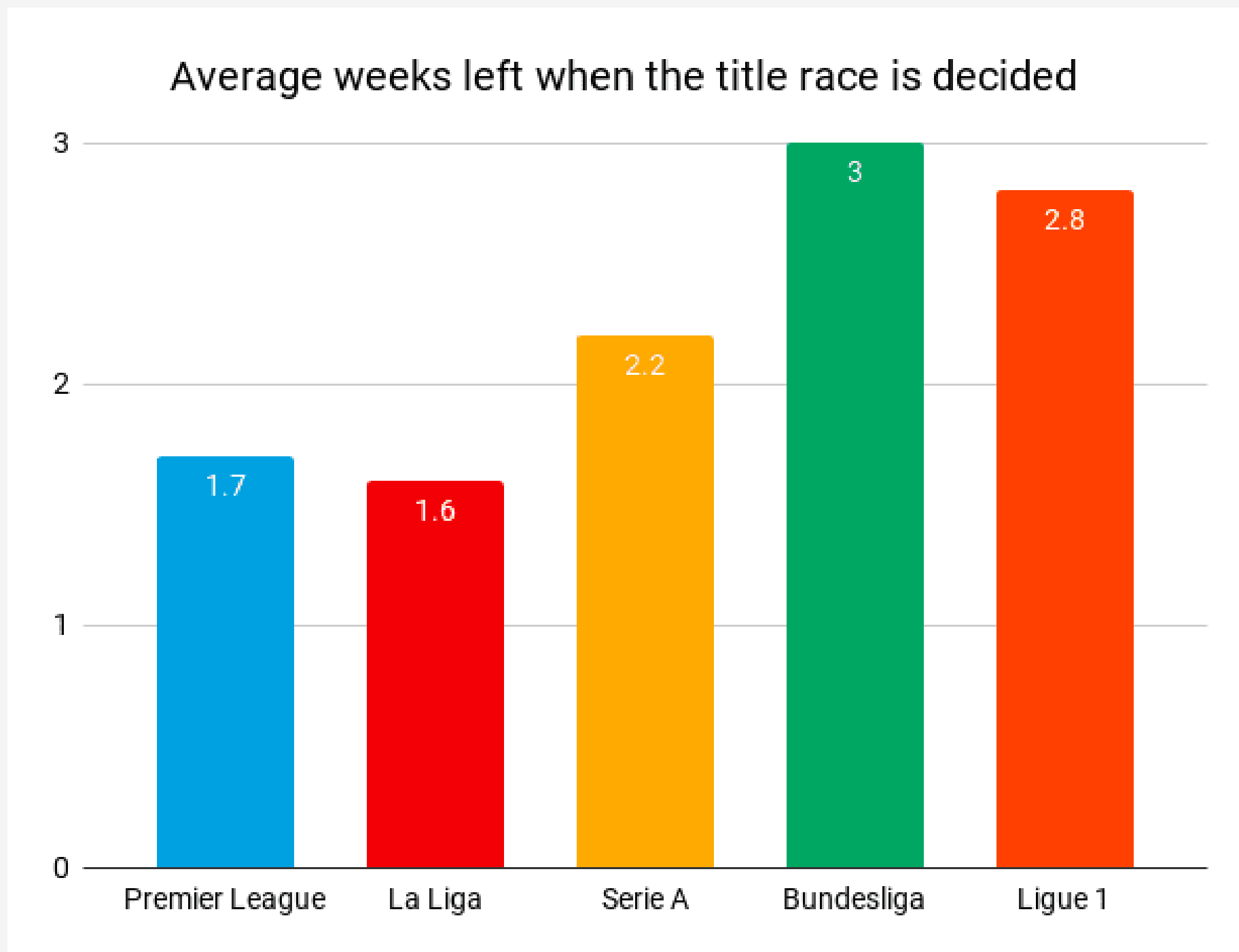
# Understanding European Soccer

Domestic Football Title Distribution - Top 5 European Leagues (1963-Present)



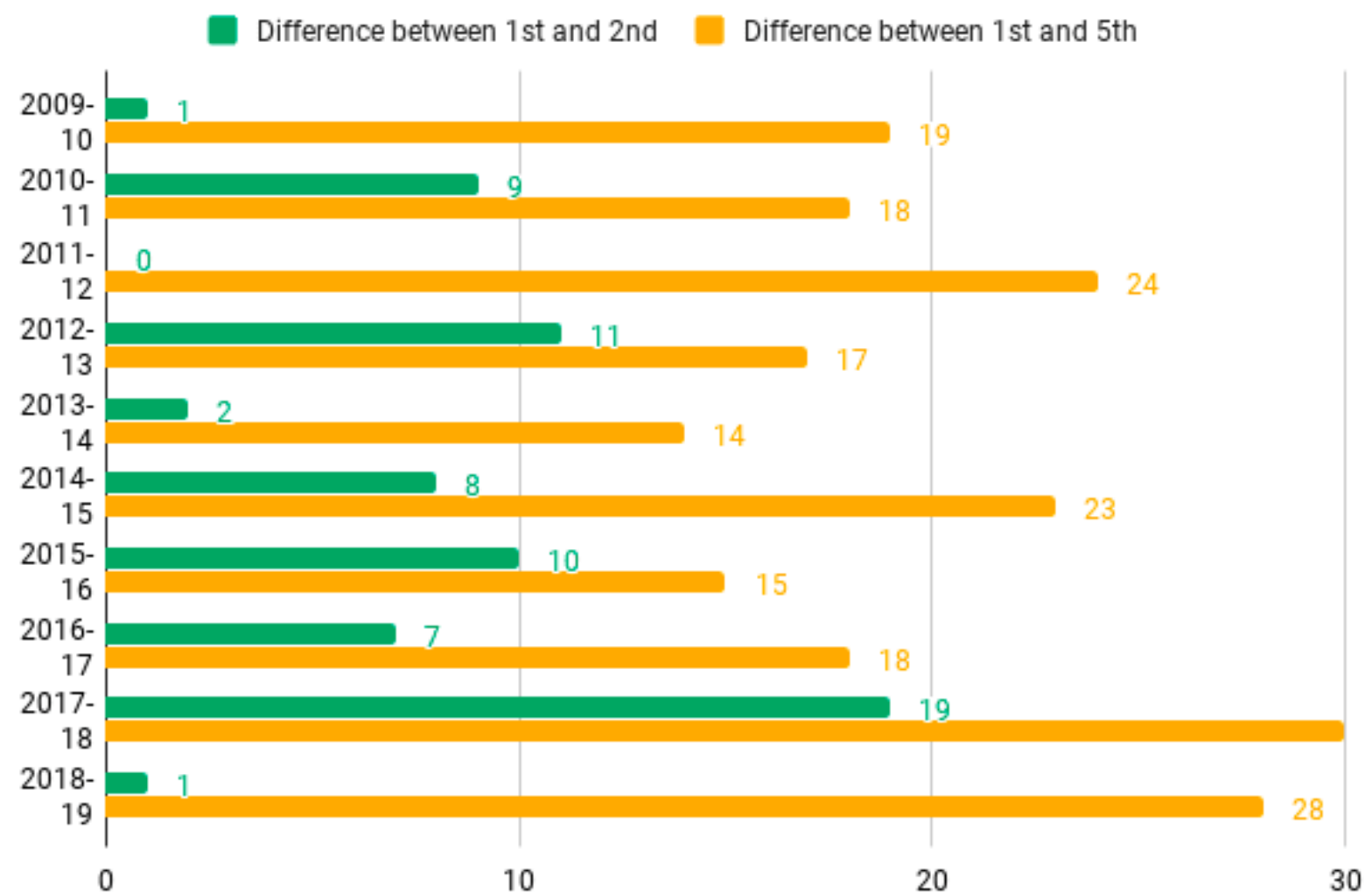
(austin\_rettig, 2022)

# How Competitive are these leagues?

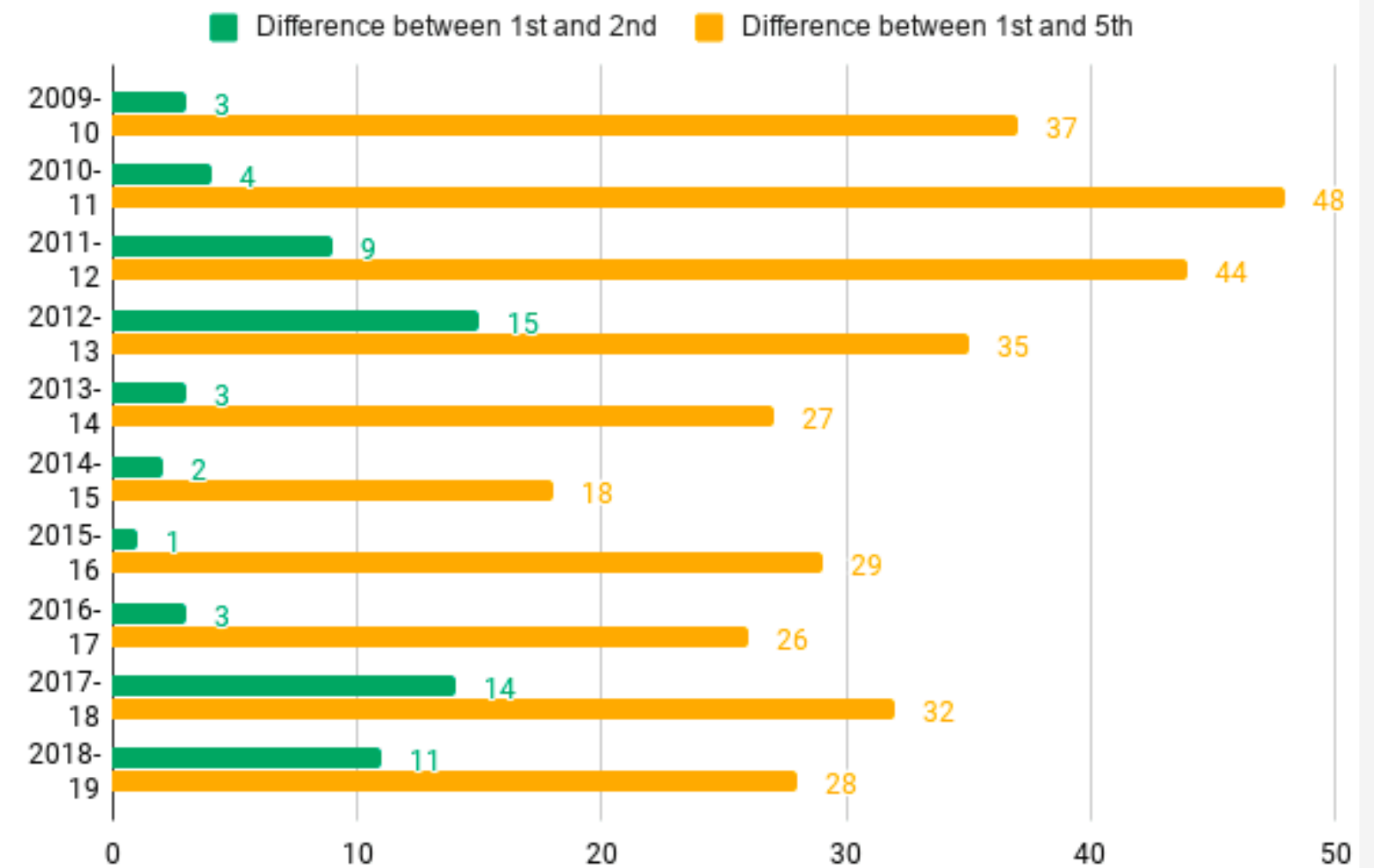


# How Competitive are These Leagues?

## Premier League



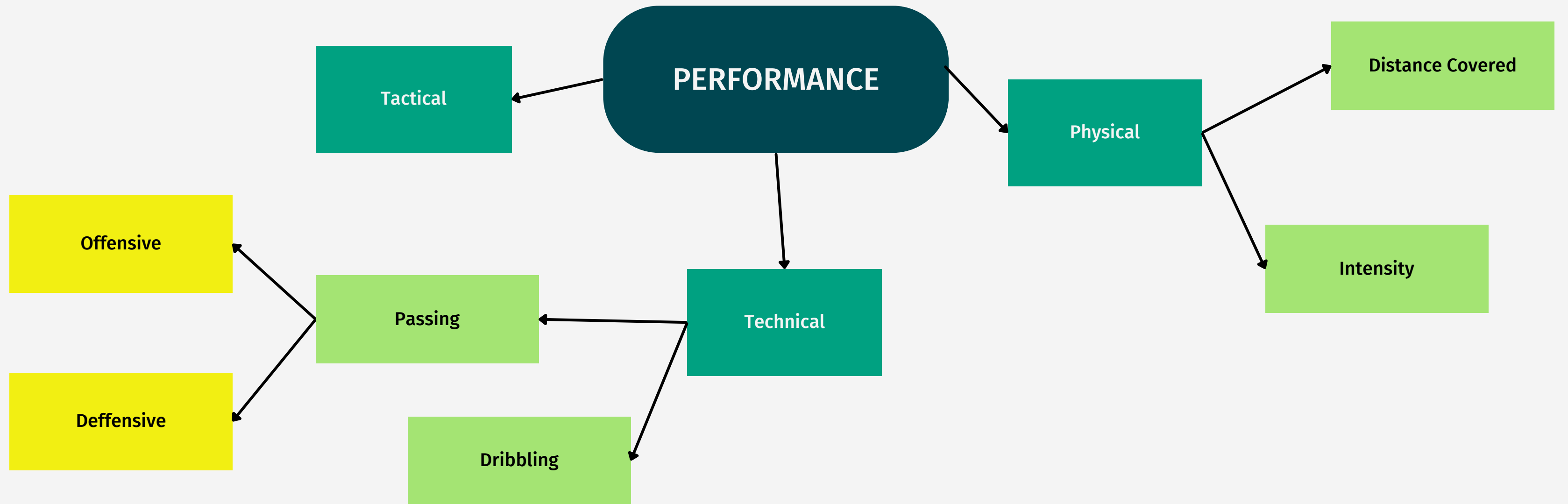
## La Liga





# Key Performance Indicators for Performance

Tip: Understanding teams or players KPI's can help teams develop a plan when facing an opposing team



# Distance Covered and intensity

## Winning Matches

- Attacking players tend to run in high intensity
  - Greater tendency for counterattacks when in possession
- Defenders run in high intensity relatively less
  - Greater tendency for deep defending when opponents have possession

## Draw or Loosing Matches

- Attacking players exhibit lower intensity in running
- Defenders run in higher intensity
  - Suggesting a more proactive defensive strategy

## The relationship between Age and Intensity

- The relation strength increases with consideration of distance covered in high intensity.
- Age correlates with distance covered, primarily affecting attacking positions.
- Younger players have an advantage in both tendency and ability to furnish high-intensity efforts.

Figure 4: gap in sprint distance between teams and goal difference during a match

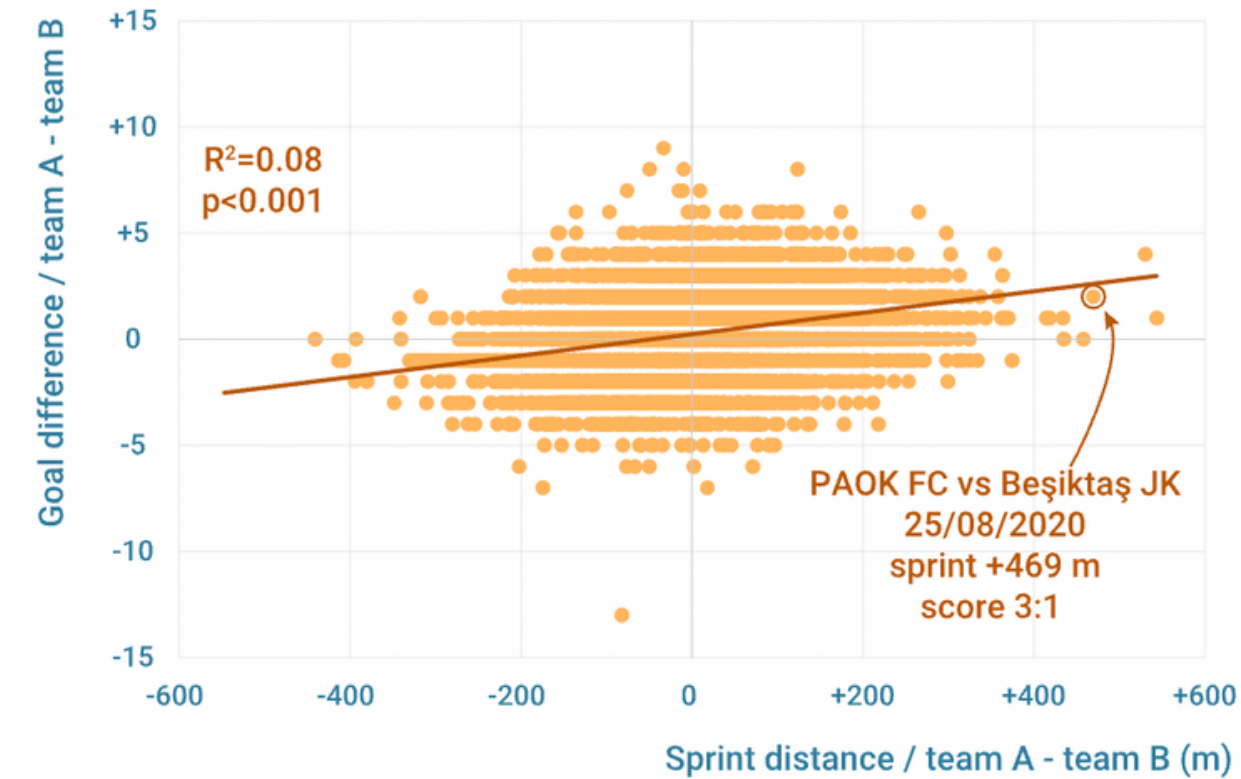
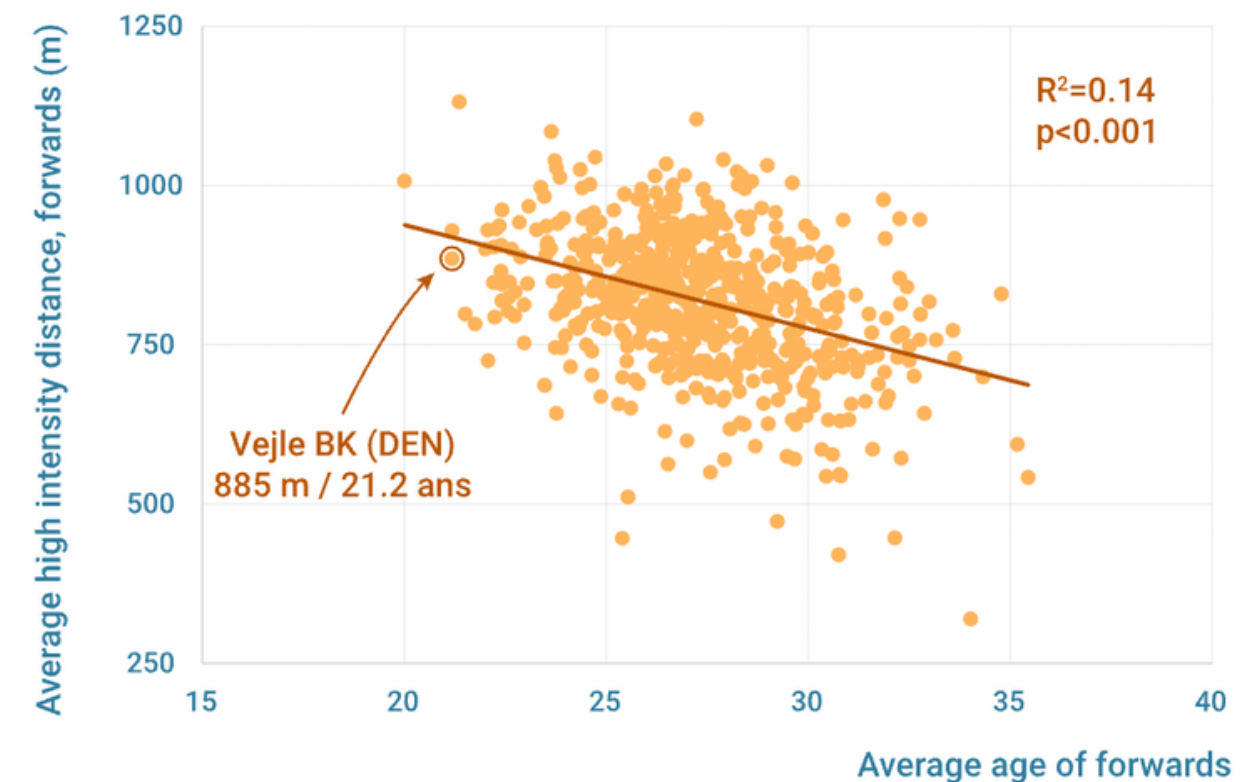


Figure 6: average distance in high intensity and forwards' average age on the pitch, per team

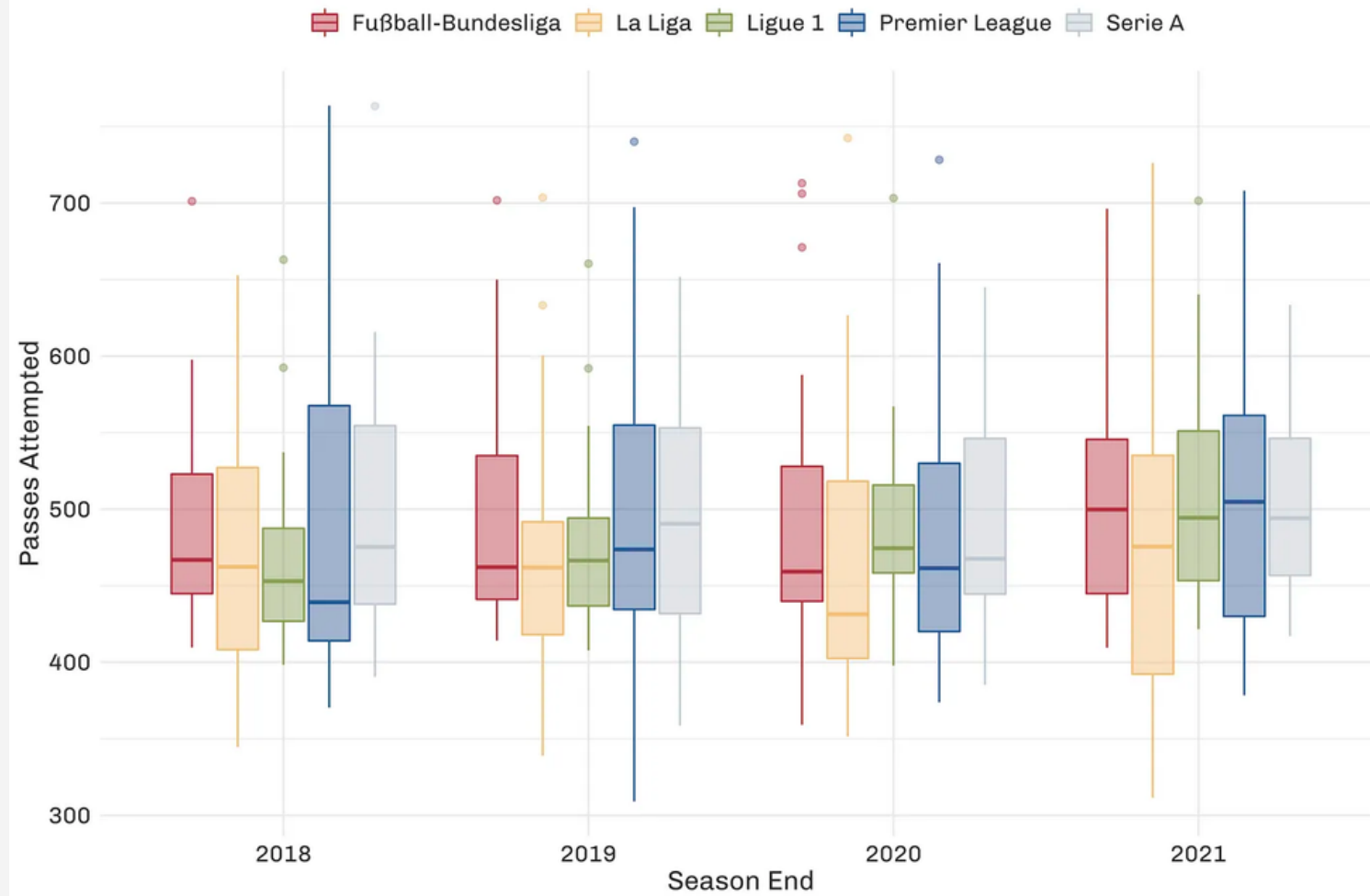




# Technical

## NOT ALL TEAMS IN THE LEAGUE ARE CREATED EQUAL

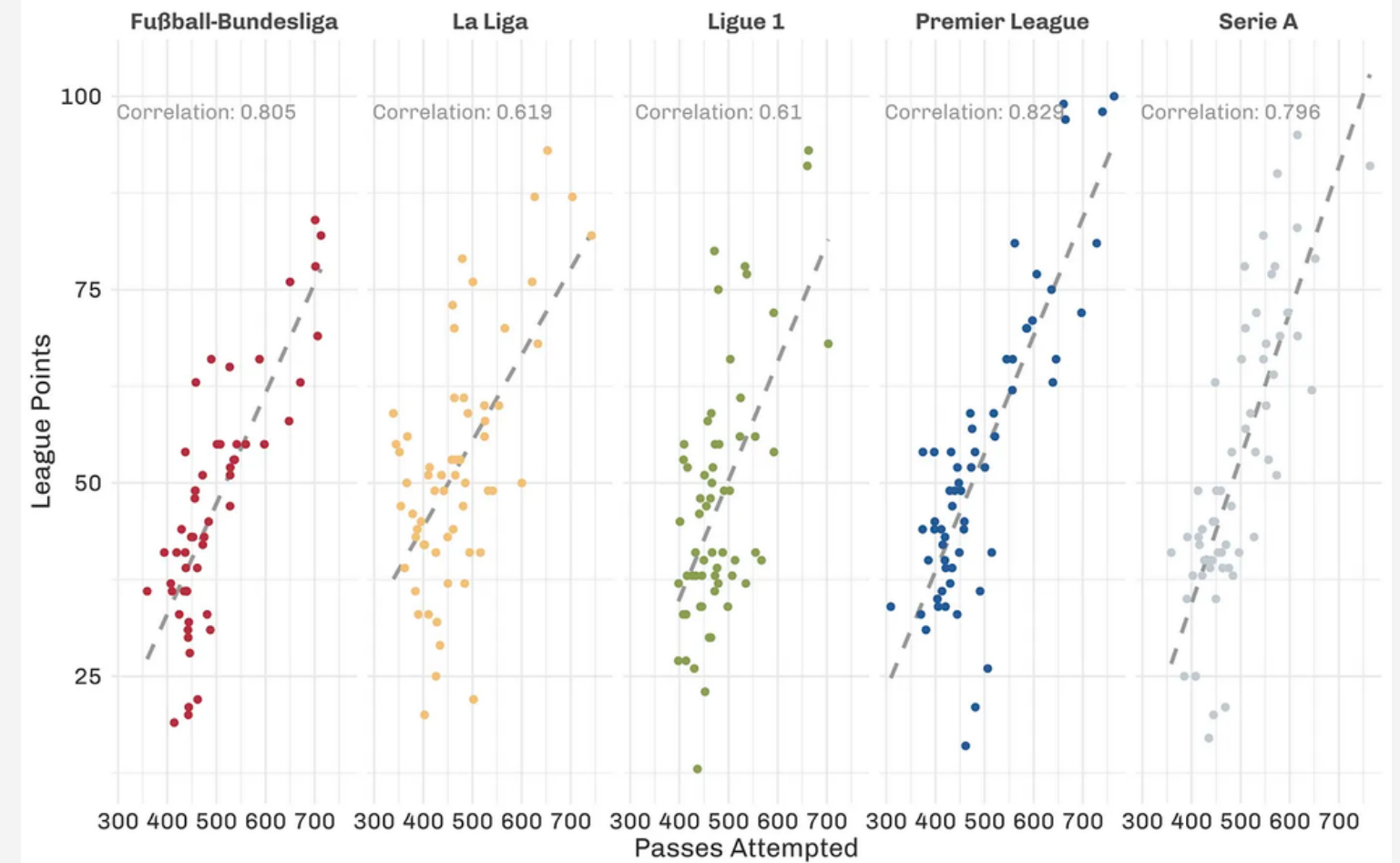
Teams in Serie A and Ligue 1 have the least variability in passes per 90 minutes for teams, while La Liga has the greatest variability



\*Data current to 2021-01-29  
Source: worldfootballR/fbref.com || Table: @jaseziv

## THE BETTER TEAMS ALSO ATTEMPT MORE PASSES

While correlation does not imply causation, it can be seen that teams that earn more league points, also tend to attempt more passes per 90 minutes of football, and more so for the EPL, Bundesliga and Serie A



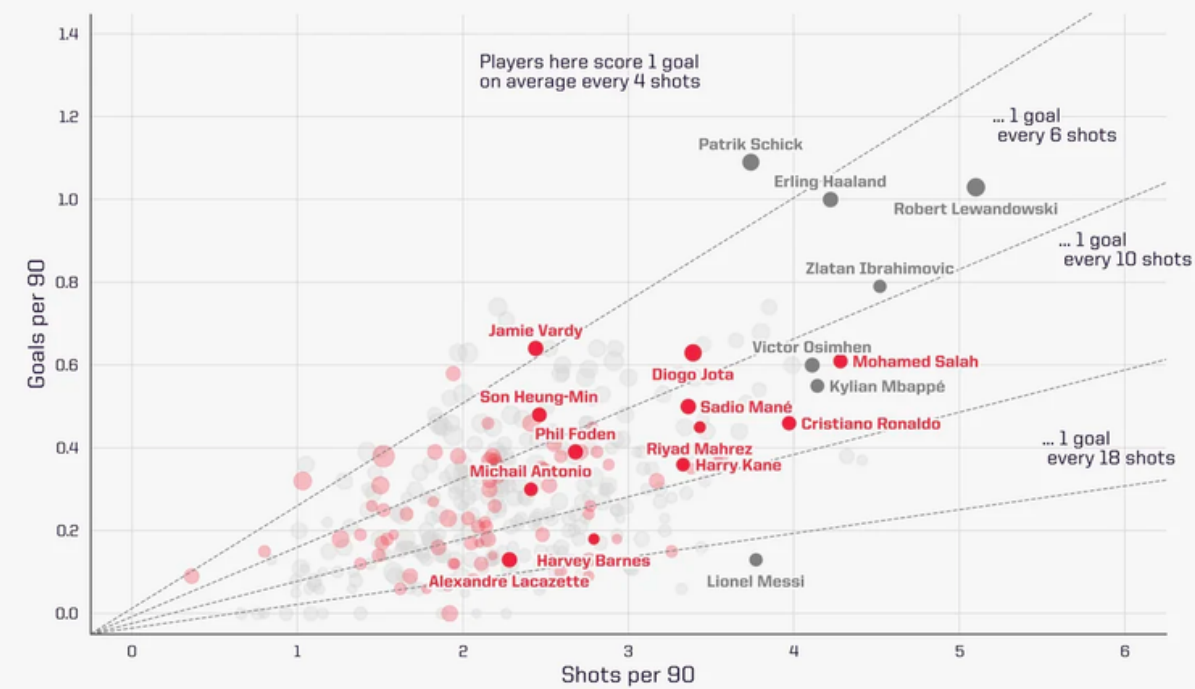
\*Data current to 2021-01-29  
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# Tactical

## How many shots does it take for an attacking player to score in elite football?

Shot data taken from Europe's top five leagues is used to compare non-penalty shots and goals per 90 minutes played. Colour represents the **English Premier League** and size  $\bullet \rightarrow \bullet$  shows average expected goal value per shot.



Dataset limited to attacking players who have scored at least one non-penalty goal and played a minimum of 900 minutes in season 2021-22. Created by Peter McKeever / @petermckeever



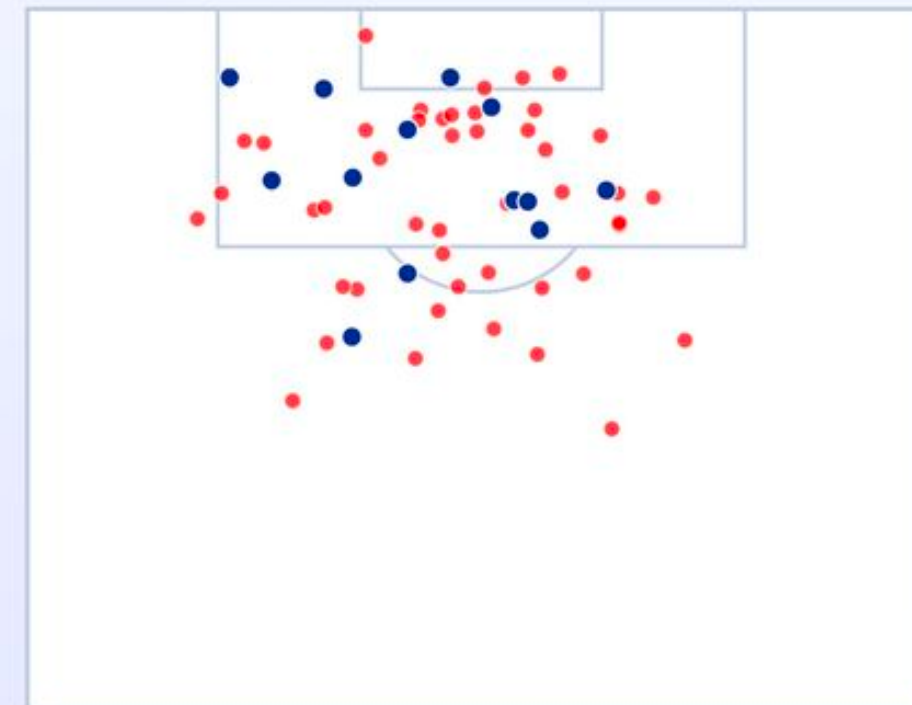
## CHELSEA SHOT MAP

Past four games in all competitions



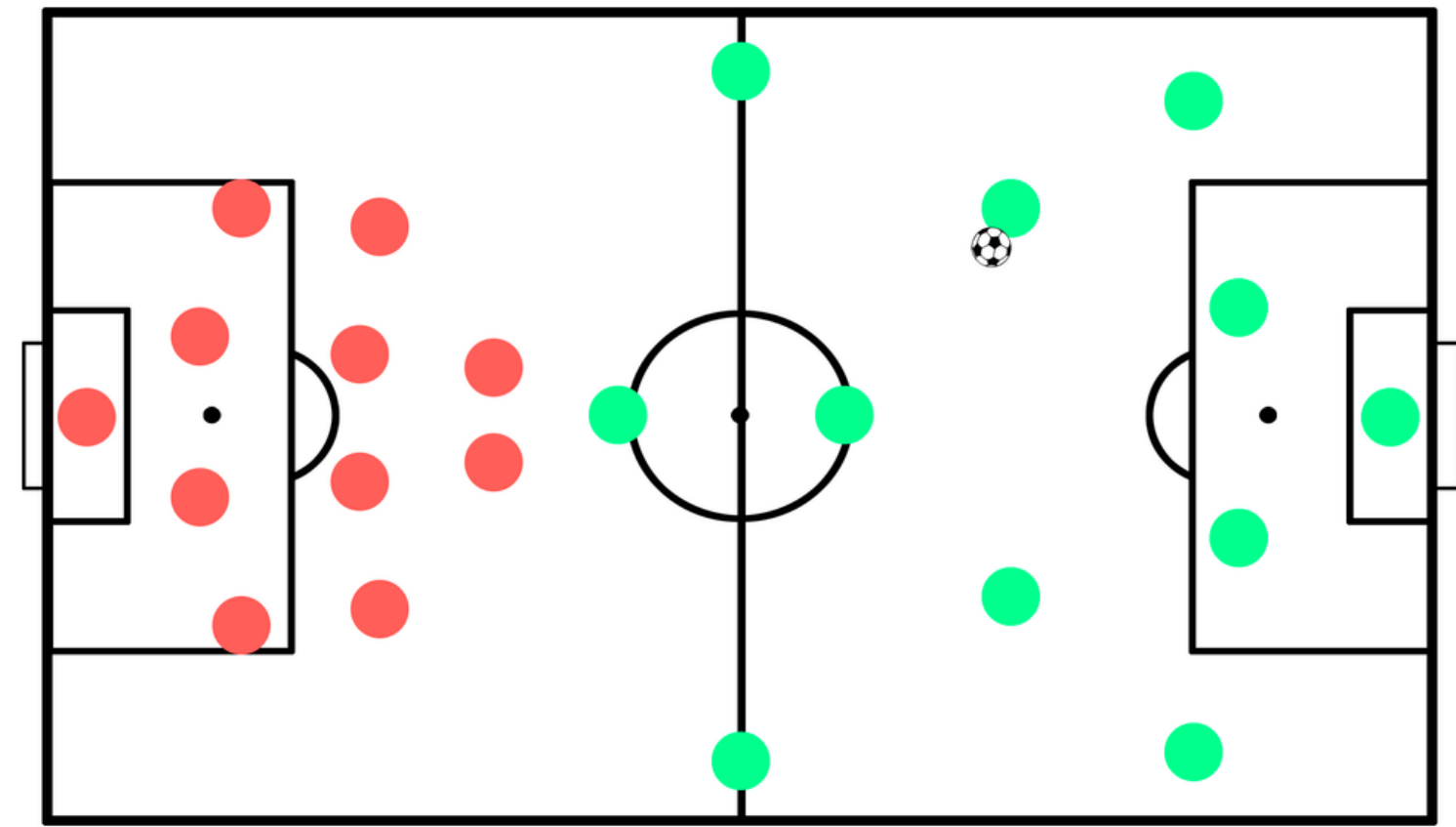
☆ Goal  
○ Shot

On target  
Off target

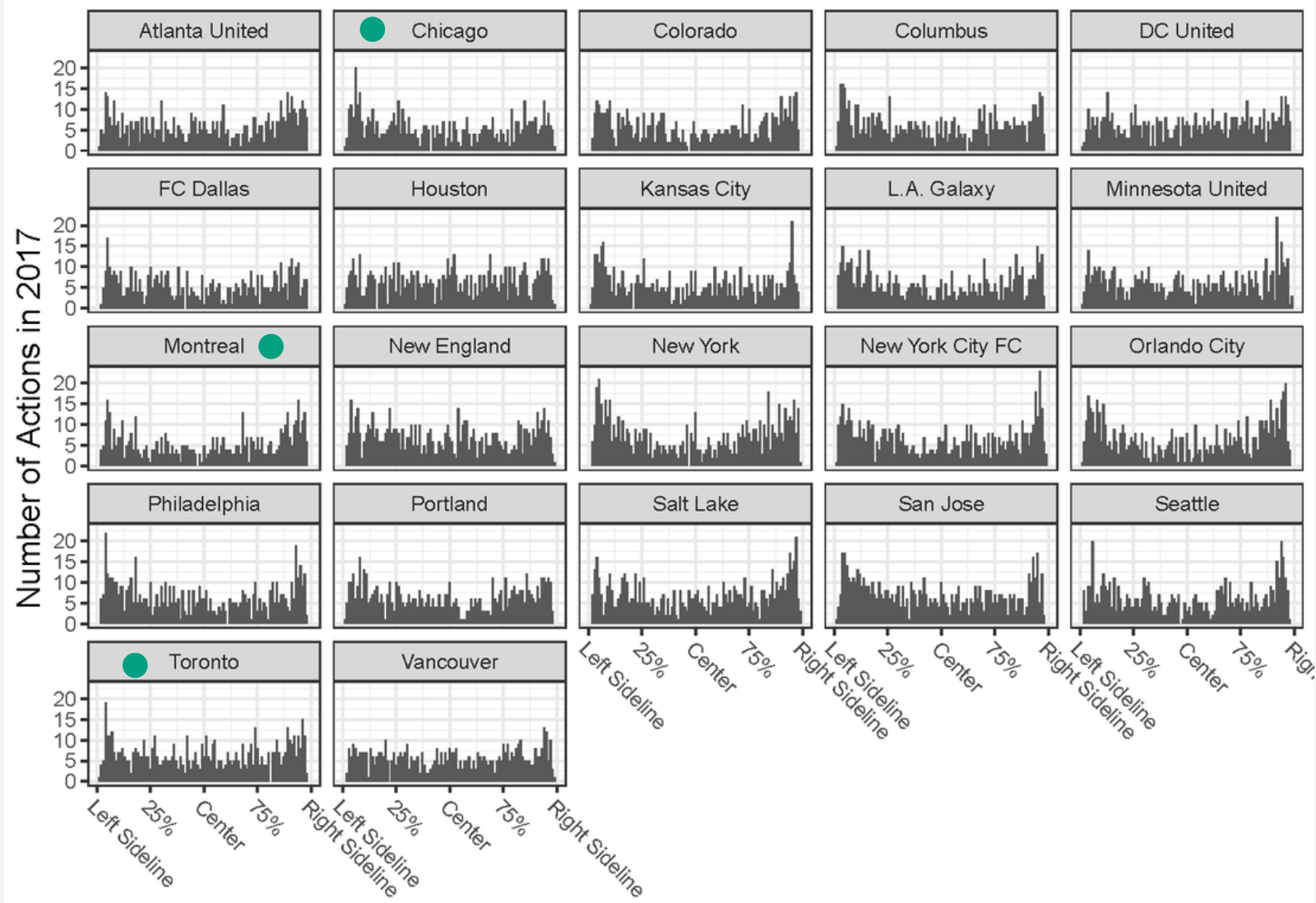


# Defensive

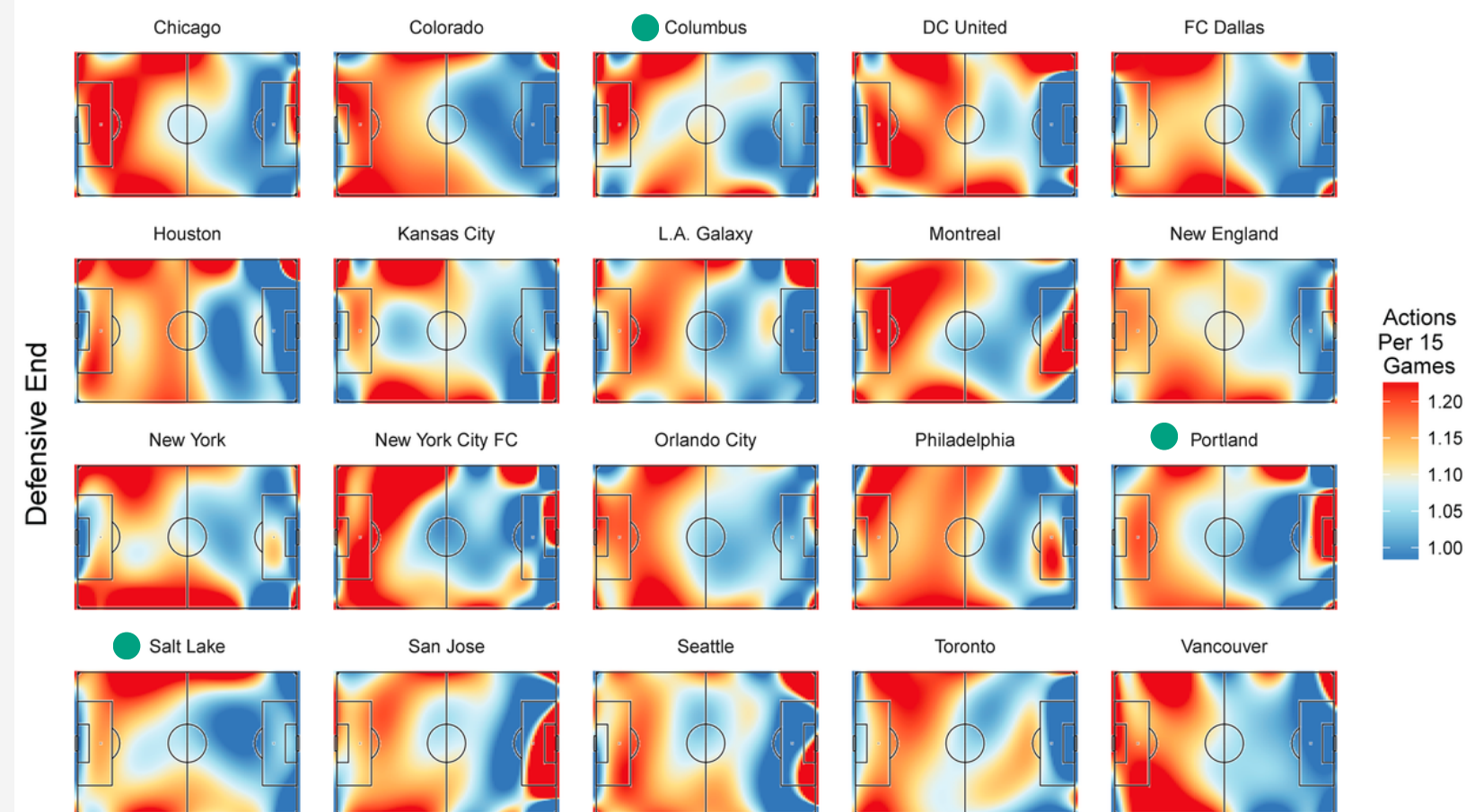
4-4-2 (LOW BLOCK) VS 4-2-3-1 (IN POSSESSION)



Defensive Actions by Field Position (Left-Right)



Expected Number of Defensive Actions



# Why do we Care?



## Physical Metrics:

- Identify fitness levels and workload distribution.
  - Personalize training programs and prevent injuries.
  - Benchmark players and track improvements.
- 

## Technical Metrics:

- Analyze spatial patterns and movement tendencies.
  - Inform strategic planning and positioning adjustments.
  - Adapt game strategies based on opponent trends.
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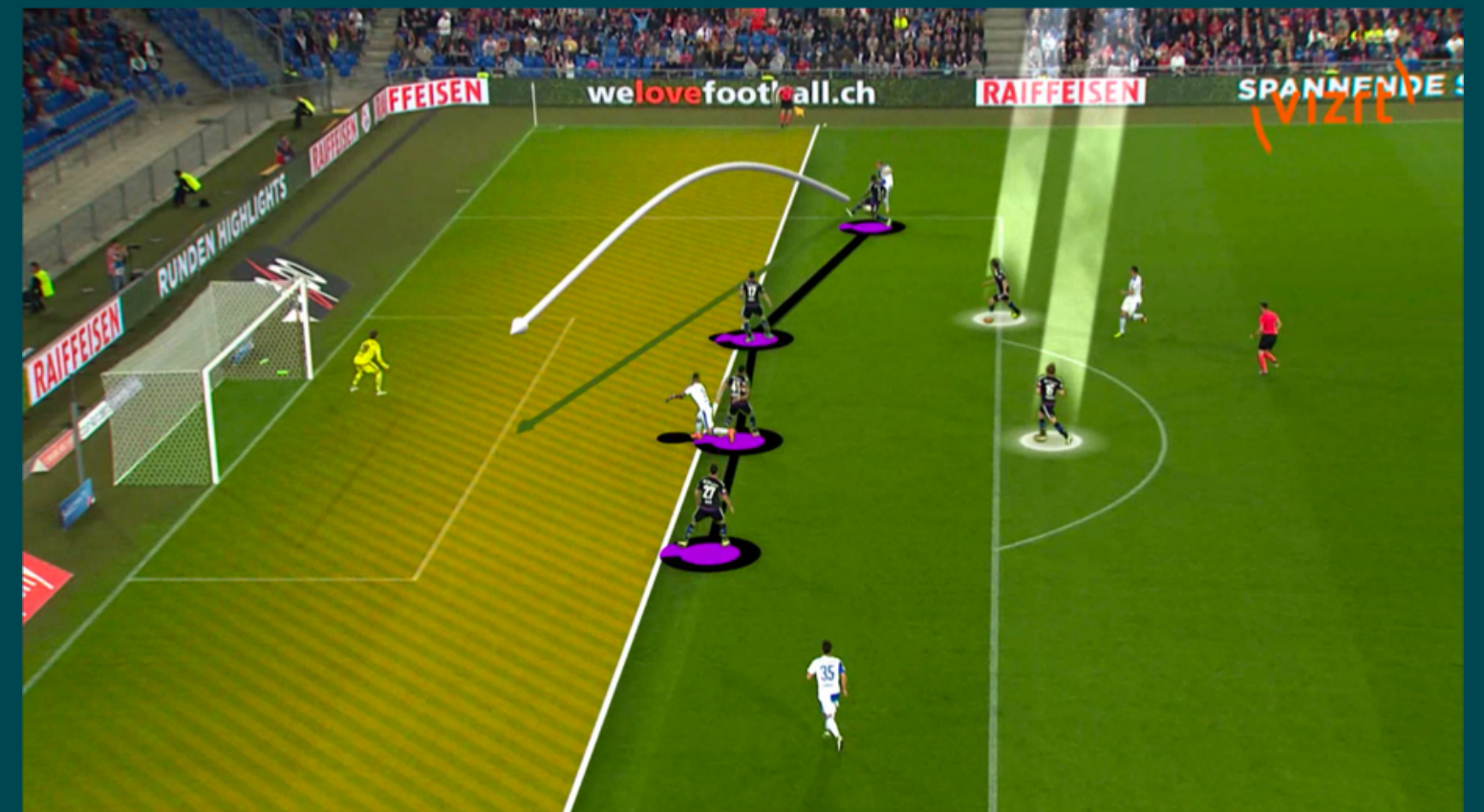
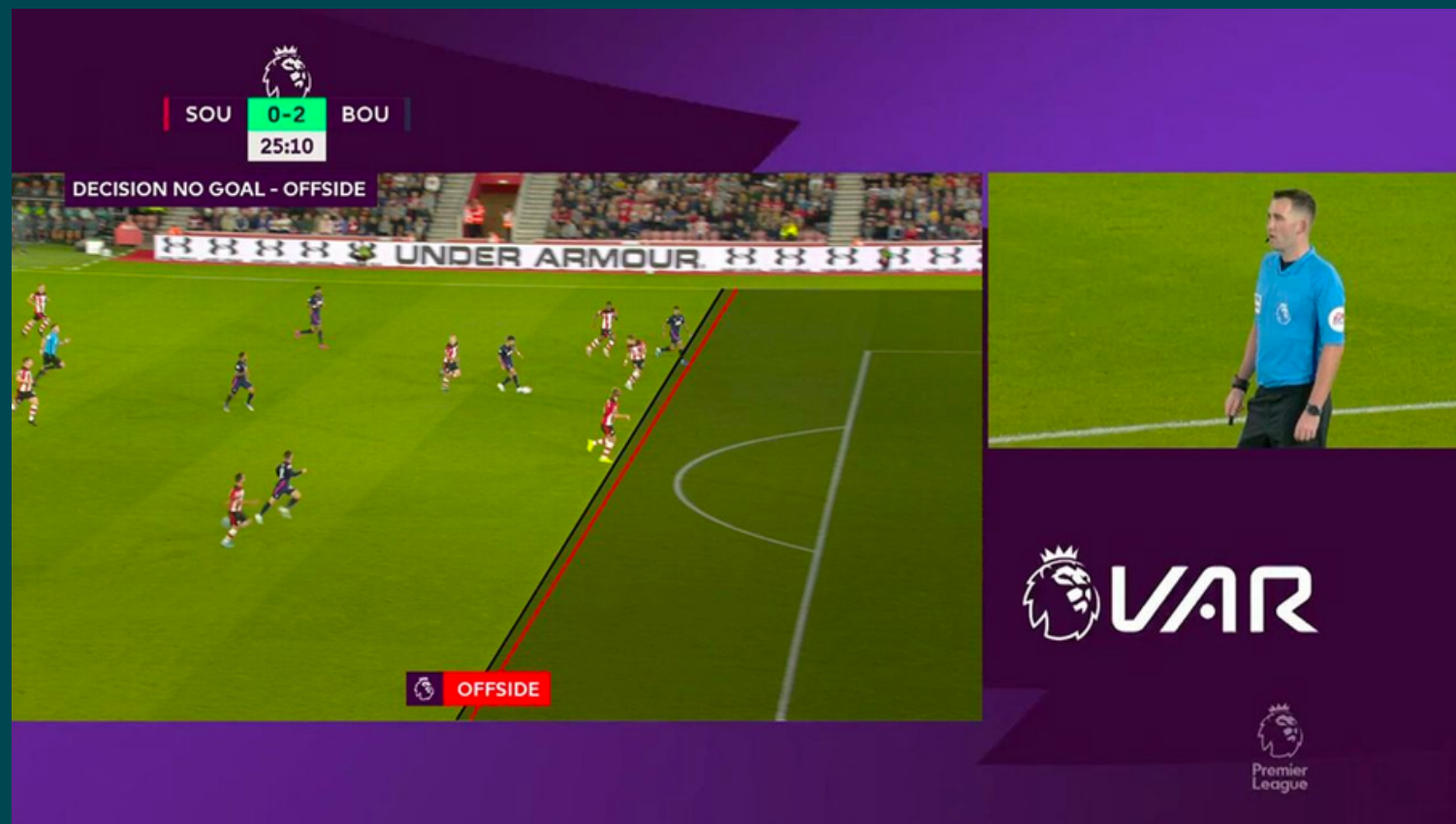
## Tactical

- Analyze spatial patterns and movement tendencies.
- Inform strategic planning and positioning adjustments.
- Adapt game strategies based on opponent trends.
- Assess overall team control and ball distribution.
- Guide offensive and defensive strategies and player positioning.



# Broadcasting

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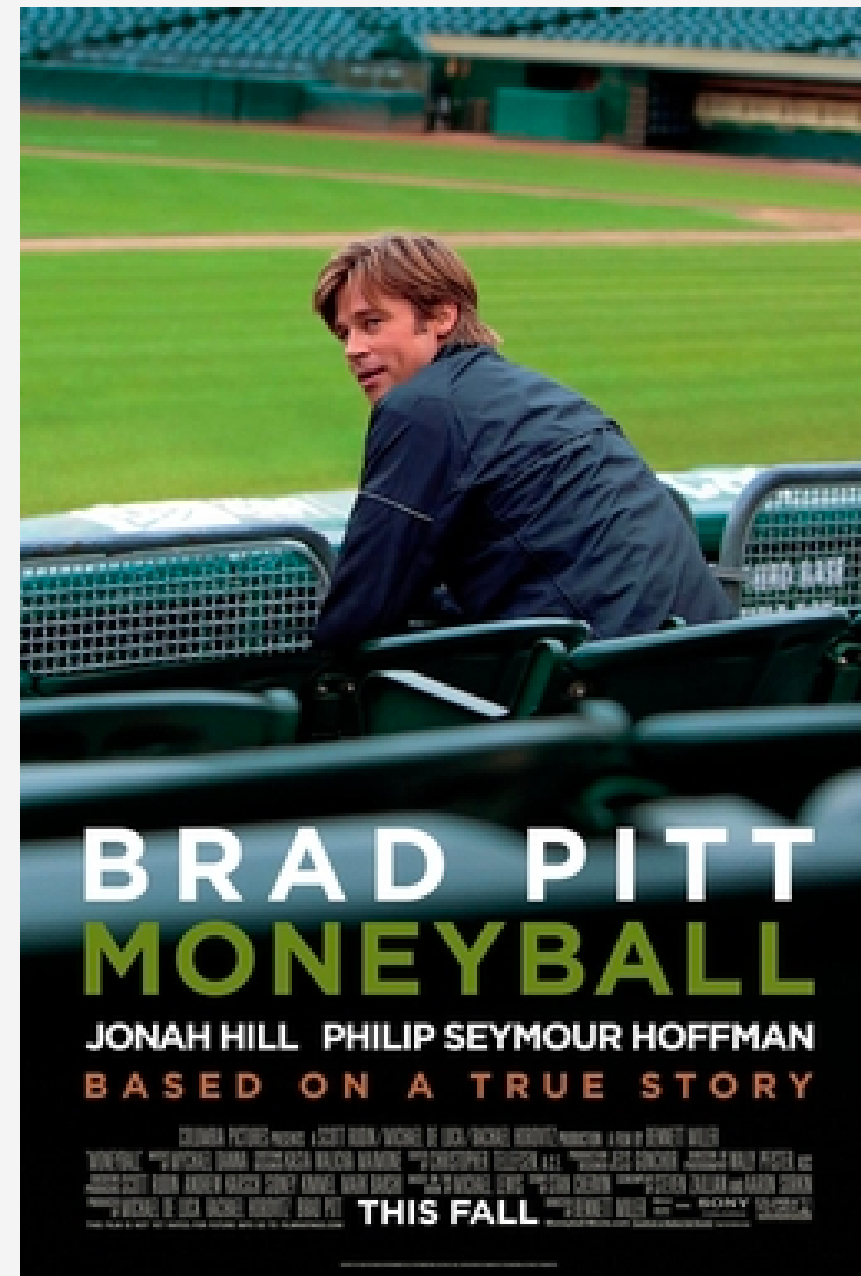


- VAR
- Helps decide decisions on the game in real time

- Player highlights
- Enhances ability to critique and improve performance.

# Future of Sport

- "It's about using statistical analysis to find undervalued players."
- "Adapt or die."



# Is a Data-Driven Approach Right for Soccer?

## Objective Analysis

- Objective insights into player performance
- Improve team tactics and game outcomes
- Reducing reliance on subjective opinions or biases.

## Performance Optimization

- Allows coaches and players to identify strengths, weaknesses
- Targeted training programs and strategic adjustments.

## Strategic Decision-Making

- Help coaches make informed decisions regarding team formations, player selections, and in-game tactics.
- Enhances the team's competitive advantage.

## Player Development

- Tracking individual player metrics over time facilitates personalized development plans
- Focuses on improving specific skills and maximizing player potential.



# Do you have any questions?

Feel free to ask away!!



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