

Categorized Metrics

Put all of the metrics from the “RAW BRAINSTORMING” section into categories

-Scroll down if you want to see all the metrics-

1. Tackling Efficiency Metrics

- Tackle Success Rate
 - Proportion of successful tackles to attempted tackles.
- Average Distance Covered
 - Distance a defender travels from the moment of the pass catch or line break to the point of tackle.
- Difficulty of Tackles
 - Calculated using the speed and direction of the ball carrier, defender's approach angle, and distance to the nearest teammate.
- Consistency
 - Frequency and reliability of a player making successful tackles in similar situations.
- Missed Tackle Rate
 - 'pff_missedTackle' data to calculate the ratio of missed tackles.
- Relative Speed and Angle between the defender and the ball carrier
- Total Yards Gained/Lost
 - Evaluating the impact of tackles on yardage
- Rate of closing the distance to the ball carrier.
- Angle of Approach
- Angle of Approach: Frequency of being at the expected tackle point.
- Frequency of being at the expected tackle point.
- Consistency
 - If the player has had multiple opportunities to tackle, do they always make the tackle?
- How many times a player is at the expected tackle point
 - Expected tackle point is the point on the field where a tackle is most likely to occur based on player speeds and angles– larger metrics

2. Contextual Game Factors

- Importance to Game
 - Evaluating the significance of the tackle in the game context
 - preventing a touchdown in the red zone
- Game Situation Variables
 - Down
 - distance to go

- score difference
 - time remaining
 - importance of the play (third-down conversions are more)
- Use the tracking data to calculate the speed and direction of the ball carrier at the time of the tackle
 - Faster and more agile ball carriers would increase the difficulty rating
- Total Yards Gained/Lost
 - Both offense and defense

3. Physical and Environmental Factors

- Player Attributes
 - Height
 - Weight
 - Position
- Player Fatigue Estimation
 - Total distance covered
 - number of plays involved in
 - Games played thus far in season
- Player Efficiency Rating
 - Comparing individual performance metrics against league averages.
- Snap Count and Participation Rate
 - Number of snaps played and the percentage of total snaps.
- Passer Rating (for Quarterbacks)
 - A measure of the performance of passers
- Catch Rate (for Receivers)
- Yards After Initial Contact (for Running Backs) to see a player's ability to resist tackles.

4. Player Interaction Metrics

- Nearest Teammate/Opponent Distance
 - Proximity of other players which could influence the tackling strategy.
- Identifying potential for group tackles based on proximity and efficiency of
- Pressure Rate and Time to Pressure
 - Frequency pressuring the opposing

RAW BRAINSTORMING

1. “Larger” ideas:

1. Create a scoring system that quantifies a defender’s tackling efficiency in open-field scenarios.
 - Tackle Success Rate: Calculate the proportion of successful tackles to attempted tackles for each player. This will be a primary indicator of tackling efficiency.
 - Average Distance Covered
 - Measure the average distance a defender travels from the moment of the pass catch or line break to the point of tackle.
 - shows responsiveness and speed in open-field situations.
 - Difficulty of Tackles
 - Use the tracking data to calculate the speed and direction of the ball carrier at the time of the tackle
 - Faster and more agile ball carriers would increase the difficulty rating
 - Defender's Approach Angle
 - certain angles may be more challenging for successful tackles.
 - distance to the nearest teammate
 - more isolated situations could be considered more difficult
 - Importance to game
 - If the open field runner was closer to the red zone, score goes up bc the defender probability helped to prevent a touchdown
 - Consistency
 - If the player has had multiple opportunities to do this, do they always make the tackle?
2. Create a model that predicts the probability of a successful tackle based on different factors
 - a. What we have
 - i. player speed
 - ii. distance from the ball carrier
 - iii. angle of approach
 - iv. Down
 - v. distance to go
 - vi. player positioning
 - vii. score difference, time remaining, and importance of the play (third-down conversions the player is more stressful?)
 1. can influence a player's performance and decision-making??

- viii. Height weight
- ix. Numbers of plays they have been involved with that day
 - 1. More plays could lead to fatigue?
- b. Metrics to make
 - i. the relative speed between the defender and the ball carrier
 - ii. angle between the defender and the ball carrier
 - iii. Nearest Teammate/Opponent Distance
 - 1. Identify if other defenders are close enough to contribute to a group tackle
 - 2. Calculate if the close player's are actually good / historically have a good tackling success rate

2. For IDPI

Used by old winner:

- Number of Active Plays
- Weight
- Height
- Individual Play Disruptions
 - Count of plays where the player has a forced fumble, sack, or significantly affects the play outcome
- Individual Disruptions per Play
 - Individual Play Disruptions divided by Number of Active Plays
- Player Speed and Acceleration
 - Average and maximum values of 's' (speed) and 'a' (acceleration) from the Tracking data

More we can do:

- Pressure Rate
 - How many times does the player pressure the QB? Maybe times they were within X yards
- Time to Pressure
 - Time it takes to get within X yards for QB
- Missed Tackle Rate
 - Sum of 'pff_missedTackle' divided by total tackle attempts (tackle + assist + missed tackle).
- Total Yards Gained/Lost
 - Both offense and defense

- Turnover-Related Stats
 - Parse description again?
- Total tackles and assists
 - Sum of 'tackle' and 'assist' from the Tackles data.
- Player Efficiency Rating
 - Put in GC: if the average Sack Rate in the league is 5%, and player Matt has a Sack Rate of 8%, their efficiency in this aspect is higher than average
- Passer Rating (for Quarterbacks)
 - A measure of the performance of passers
- Typical Yards After Catch
- Blocking Efficiency (for o line man)
 - Do for both running and passing plays?
- Missed Tackles
- Red Zone Efficiency
 - performance (maybe tackles? sacks) of a player within the 20-yard line.
- Snap Count and Participation Rate
 - The number of snaps played and the percentage of total snaps.
- Number of games played versus games missed due to injury – manually find this?
- Closing Speed
 - The rate at which a defender closes the distance to the ball carrier.
- Angle of Approach
- How many times a player is at the expected tackle point
 - Expected tackle point is the point on the field where a tackle is most likely to occur based on player speeds and angles– larger metrics
- Quantify the change in the game's outlook directly attributable to a tackle
 - A tackle in a close game during the final minutes would have a different impact score compared to one made during a less critical time.
- Yards a running back gains after initial contact with a defender.
 - indicator of ability to resist tackles
- Catch Rate
 - The percentage of passes thrown to a receiver that are caught