

Technical performance, activity and profiles

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Thanks to the partnership with [Impect](#), the CIES Football Observatory research team has developed a comprehensive methodology to objectively measure from a statistical perspective the technical performance of outfield players, assess their technical activity in different game areas, and determine their technical profiles.

(1) Technical performance

In terms of technical performance, we selected various actions frequently performed by players, which were classified into eight game areas and combined as follows:

- **Air defence:** defensive (out-of-possession) aerial duels won compared to team average and success rate; goal conceded frequency when player on the pitch.
- **Ground defence:** ground duels won in own half compared to team average and success rate; interceptions in own half compared to team average; goal conceded frequency when player on the pitch.
- **Build-up:** successful passes from own half compared to team average and success rate.
- **Orchestration:** successful passes from opponent half compared to team average and success rate.
- **Take on:** successful dribbles and success rate; progressive carries of at least eight metres towards the opponent's goal.
- **Chance creation:** passes leading to a shot weighted by the probability of a goal (xG of shots); passes leaving at most one outfield opponent closer to the goal than the ball; successful passes to a teammate in the central rectangle of the opponent box.
- **Finishing:** number and effectiveness of shots (gap between goals scored and expected); goal frequency.
- **Air attack:** attacking (out-of-possession) aerial duels won compared to team average and success rate; headers.

To account for the competitiveness of the matches in which players participate, the values are generally weighted by the games' sporting level according to [this method](#), as well as by the average number of minutes per match played, so as valuing rarely substituted starting 11 players. Weighted performance refers to values adjusted by the sporting level of the matches played, while raw performance refers to non-adjusted values. In both cases, values are rescaled from 5 to 100.

Raw or weighted overall performance indices are calculated from game area scores by averaging the maximum value (aerial play areas excluded, except at defensive level for centre backs) and the median value of the following metrics per position: the six non-aerial areas for wide backs and midfielders; air defence, ground defence, build-up, orchestration, take on and chance creation for centre backs ; orchestration, take on, chance creation and finishing for wingers; take on, chance creation, finishing and air attack for centre forwards. An adjustment by position ensures the comparability between all players.

Performance to team and to league indices are also calculated by comparing the player's value to the average measured across his team and league respectively, highlighting players who are outperforming their teammates or league rivals (any value greater than one). To assess the most influential players in a specific competition, whether for specific game areas or overall performance indices, total playing time is also sometimes added as a weighting factor.

(2) Activity

To determine player activity, we again selected various technical actions frequently performed by players, classified into the same eight game areas as above, and combined net of the player's team non-possession (air defence and ground defence) or possession (all other areas) time as follows:

- **Air defence:** defensive (out-of-possession) aerial duels.
- **Ground defence:** ball wins from duels, loose balls, interceptions and blocks.
- **Build-up:** passes attempted from own half.
- **Orchestration:** passes attempted from opponent half.
- **Take on:** dribbles attempted and progressive carries of at least eight metres towards the opponent goal.
- **Chance creation:** passes leading to a shot weighted by the probability of a goal (xG of shots); passes leaving at most one outfield opponent closer to the goal than the ball; successful passes to a teammate in the central rectangle of the opponent box.
- **Finishing:** shots attempted.
- **Air attack:** attacking (in-possession) aerial duels.

For each area, an activity ratio is calculated by dividing the player's value by the average of all players (activity to all players), players from the same team (activity to team) and players from the same position (activity to position). The ratios are standardised using a z-score and centred around 1 to ensure comparability between all game areas (1=average). To calculate positional averages, the following categories were considered: centre backs, wide backs, midfielders, wingers and centre forwards. For players fielded in multiple position categories, the positional average was calculated according to minutes played in each one.

(3) Technical profiles

Players' technical profiles are determined according to players' main position (centre back, wide back, midfielder, winger and centre forward) and the average value of their activity to team and position ratios, whether with respect to all competitions (general technical profile) or with respect to the league of belonging (league technical profile) to account for players' specificities net of dominant playing styles. In total, 16 technical profiles were identified: three for centre backs, three for wide backs, four for midfielders, three for wingers and three for centre forwards.

> Ball-fighting centre backs

Centre-backs in the top third for the ratio between the average of defensive values (ground defence and air defence) and that of passing ones (build-up and orchestration).

> In-between centre backs

Centre-backs in the middle third for the ratio between the average of defensive values (ground defence and air defence) and that of passing ones (build-up and orchestration).

> Ball-playing centre backs

Centre-backs in the bottom third for the ratio between the average of defensive values (ground defence and air defence) and that of passing ones (build-up and orchestration).

> Ball-chasing wide backs

Wide backs in the top third for the ratio between the average of defensive values (ground defence and air defence) and that of offensive ones (chance creation, take on and finishing).

> In-between wide backs

Wide backs in the middle third for the ratio between the average of defensive values (ground defence and air defence) and that of offensive ones (chance creation, take on and finishing).

> Forward-pushing wide backs

Wide backs in the bottom third for the ratio between the average of defensive values (ground defence and air defence) and that of offensive ones (chance creation, take on and finishing).

> Full-range midfielders

Midfielders with values above 1 in at least one defensive area (air defence or ground defence), one passing area (build-up or orchestration) and one offensive area (take on or finishing).

> Ball-winning midfielders

Non-full-range midfielders with the highest value in air defence or ground defence (not including air attack).

> Playmaking midfielders

Non-full-range midfielders with the highest value in build-up or orchestration (not including air attack).

> **Threat-oriented midfielders**

Non-full-range midfielders with the highest value in chance creation, take on or finishing (not including air attack).

> **Linking-up wingers**

Wingers in the bottom third for take on values.

> **In-between wingers**

Wingers in the middle third for take on values.

> **Infiltrating wingers**

Wingers in the top third for take on values.

> **Dropping centre forwards**

Centre forwards in the bottom third for the ratio between air attack and orchestration.

> **In-between centre forwards**

Centre forwards in the middle third for the ratio between air attack and orchestration.

> **Target man centre forwards**

Centre forwards in the top third for the ratio between air attack and orchestration.