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Comparative Analysis of Goal Situations in Modern Football: The Role of Players of Different Positions at the 2022–2026 World Cups

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Abstract

Purpose. The current stage in the development of football is characterised by an extremely high intensity of play, compactness on the pitch and the constant refinement of tactical formations. In these circumstances, the ability to convert scoring opportunities becomes a decisive factor in a team's success. The purpose of the study is to determine and comparatively evaluate the effectiveness of players of different positions (forwards, midfielders, defenders) in creating and converting goal-scoring situations in modern football, based on the analysis of matches from the 2022 and 2026 World Cups.

Materials and Methods. The study is based on a comprehensive analysis of 168 matches played at the World Cups: 64 matches of the 2022 World Cup (Qatar) and 104 matches of the 2026 World Cup (USA, Mexico, and Canada). Mathematical statistics methods were used for data processing, including the calculation of mean values and the assessment of the significance of differences using Student's t-test with determination of significance levels ($p<0.05$; $p<0.01$; $p<0.001$).

Results. The analysis indicates a pronounced functional specialization of players of different lines in the context of creating goal-scoring moments. It was established that forwards dominate in converting moments after interactions in the central zone (50.7), which statistically significantly exceeds the figures for midfielders (25.1) and defenders (3.9). Midfielders demonstrate high effectiveness both in the central zone and in flank interactions (10.7), ensuring the transitional phase of the game. Of particular note are the indicators for defenders, who show their highest effectiveness in finishing from set-pieces (7.3) compared to other game situations. The assessment of significance (t-test) confirms that the differences between the indicators of players of different lines are statistically significant (most values $p<0.001$ and $p<0.01$), which is graphically reflected in the results of the t-criterion analysis.

Conclusions. The study confirms that the tactical structure of modern football requires players of different lines to possess specific skills for finishing attacks. Forwards remain the key link in central finishing, while defenders have become a critical element in success during set-pieces. The obtained t-test data proves a high degree of validity for the identified differences, which can be used to optimize the training process and develop specialized tactical skills for football players depending on their position.

Keywords: football; goal situations; player positions; World Cup; technical-tactical actions; game activity.

Анотація

Порівняльна характеристика гольових ситуацій у сучасному футболі: роль гравців різних ліній на чемпіонатах світу 2022–2026 рр.

Перепелиця П. Є., Перевозник В. І., Паєвський В. В.

Мета. Сучасний етап розвитку футболу характеризується надзвичайно високою інтенсивністю ігрових дій, просторовою компактністю та постійним удосконаленням тактичних схем. У цих умовах процес реалізації гольових моментів стає визначальним чинником успішності команди. Мета дослідження полягає у визначенні та порівняльній оцінці ефективності гравців різних амплуа (нападників, півзахисників, захисників) у створенні та реалізації гольових ситуацій у сучасному футболі на основі аналізу матчів чемпіонатів світу 2022 та 2026 років.

Матеріал і методи. Дослідження базується на комплексному аналізі 168 матчів, проведених на чемпіонатах світу: 64 матчі чемпіонату світу 2022 року (Катар) та 104 матчі чемпіонату світу 2026 року (США, Мексика, Канада). Для обробки отриманих даних застосовано методи математичної статистики, зокрема розрахунок середніх значень та оцінку достовірності відмінностей за допомогою t-критерію Стьюдента з визначенням рівнів значущості ($p<0,05$; $p<0,01$; $p<0,001$).

Результати. Аналіз свідчить про виражену функціональну спеціалізацію гравців різних ліній у контексті створення гольових моментів. Встановлено, що нападники домінують у реалізації моментів після взаємодії в центральній зоні (50,7), що статистично достовірно випереджає показники півзахисників (25,1) та захисників (3,9). Півзахисники демонструють високу ефективність як у центральній зоні, так і у флангових взаємодіях (10,7), забезпечуючи перехідну фазу гри. Особливої уваги заслуговують показники захисників, які демонструють найвищу ефективність у завершенні стандартних положень (7,3) порівняно з іншими ігровими ситуаціями. Оцінка достовірності (t-критерій) підтверджує, що відмінності між показниками гравців різних ліній є статистично значущими (більшість значень $p<0,001$ та $p<0,01$), що графічно відображено у результатах аналізу t-критеріїв.

Висновки. Дослідження підтверджує, що тактична структура сучасного футболу вимагає від гравців різних ліній специфічних навичок для завершення атак. Нападники залишаються ключовою ланкою у центральному завершенні, тоді як захисники стали критичним елементом успішності при стандартних положеннях. Отримані дані t-критеріїв доводять високий ступінь валідності виявлених відмінностей, що може бути використано для оптимізації тренувального процесу та розвитку спеціалізованих тактичних навичок футболістів залежно від їхнього амплуа.

Ключові слова: футбол; гольові ситуації; ігрові амплуа; чемпіонат світу; техніко-тактичні дії; ігрова діяльність.

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Introduction

The modern stage of football development is characterized by an extremely high intensity of game actions, spatial compactness, and the continuous improvement of tactical systems (Yasar et al., 2025). Under these conditions, the process of converting goal-scoring opportunities becomes a decisive factor in team success (Sannicandro et al., 2020; Zileli & Söyler, 2022). Analyzing how players from different positional lines interact in the finishing phase of an attack is critical for understanding current trends in this sport (Wilson et al., 2017). Despite numerous tactical studies (Silva et al., 2024), there is a need for empirical justification regarding the role of specific playing positions in creating goal-scoring situations, especially given the transformation of players' functional duties at the highest level of competition – the World Cups. Investigating this issue not only helps refine tactical models but also optimizes the training process by accounting for the cognitive and functional demands placed on players in various positions.

The issue of tactical and technical actions in football is a subject of close attention among sports science specialists (Tuo et al., 2019; Singh et al., 2024). Questions concerning game activity modeling, analyzing the effectiveness of team interactions, and the peculiarities of decision-making by football players under pressure are examined in the works of many researchers (Singh & Lamani, 2016; Sonchan et al., 2025). Modern sports analytics platforms provide vast volumes of data, which stimulates research into identifying patterns of attack conversion (Zileli & Söyler, 2022; Šunjić et al., 2024). However, an analysis of professional literature indicates that most publications focus on general performance indicators or systemic team reorganizations (Tassi et al., 2024). In contrast, a comparative characterization of the methods used to create goal-scoring situations (interactions in the central zone, on the flanks, individual actions, set pieces) broken down by playing positions, based on data from major tournaments such as the 2022 and 2026 World Cups, requires additional scientific elaboration. The relevance of this study is driven by the need to systematize new statistical data in order to develop modern methodological recommendations for football player training.

Connection of the work with important scientific programs or practical tasks. The study was carried out in accordance with the initiative research topic in the field of physical culture and sports at the Kharkiv State Academy of Physical Culture for 2023–2028, titled "Optimization of the Training Process in Football" (State Registration Number: 0123U105317).

Purpose of the Study. The purpose of the study is to identify and comparatively analyze the statistical patterns of goal-scoring situation conversion by football players of various playing positions (forwards, midfielders, defenders) based on the analysis of matches from the 2022 and 2026 World Cups, in order to develop and improve models of tactical preparation.

Materials and Methods

The material of the study comprised 168 official matches from the final stages of the World Cups: 64 matches from the 2022 FIFA World Cup in Qatar and 104 matches from the 2026 FIFA World Cup in the United States, Mexico, and Canada.

The object of analysis was the competitive gaming activity of elite-level football players—members of national teams participating in top-tier competitions. The age range of the participants spans from 18 to 39 years, which corresponds to the period of peak professional realization in football. Among them, there were 91 forwards, 50 midfielders, and 21 defenders.

To ensure high objectivity and the possibility of study replication by other researchers, all goals scored and goal-scoring situations resulting from the analysis of the 2022 and 2026 World Cup matches were clearly differentiated into four basic tactical-technical categories:

1. Central Zone Interaction: Goal-scoring situations arising from combination play (short and medium passes, wall passes ("one-twos"), penetrative passes) directly in the central corridor of the pitch (in front of and inside the penalty area), aimed at overcoming the opponent's compact defense.

2. Flank Interaction: Episodes culminating in goals following active play on the flank areas of the pitch (speed dribbles, wing play, crosses, or cutbacks into the penalty area followed by attack completion).

3. Individual Actions: Goal-scoring situations created solely through a player's individual skill (successful dribbling, 1v1 beating of opponents, ball interception followed by an independent run or shot from outside the penalty area without active involvement of teammates in the final phase).

4. Set Pieces: Goals resulting directly or indirectly from the execution of free kicks, corner kicks, or throw-ins (including rebounds and secondary shots immediately following a set piece).

To achieve the set goal, a comprehensive set of methods was used:

1. Pedagogical Observation: A systematic analysis of video recordings and official statistical match reports was conducted. Goal-scoring situations were classified into four main categories: central zone interaction, flank interaction, individual actions, and set-piece conversion.

Mathematical Statistics Methods: The processing of empirical data obtained was carried out using applied data analysis software. The following indicators were calculated: arithmetic mean value ($\overline{X}$) for each metric and the standard error of the mean (m). To compare mean values between groups (forwards, midfielders, defenders), Student's t-test for independent samples was applied. The reliability of the obtained results was evaluated at significance levels of $p<0.05$, $p<0.01$, and $p<0.001$. This made it possible to identify statistically significant differences in the structure of goal-scoring actions depending on the players' playing positions.

Results

The obtained statistical indicators, analyzed based on 168 matches from the 2022 and 2026 World Cups, indicate a pronounced functional specialization of football players across different positions in creating and converting goal-scoring situations (Table 1).

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Table 1. Comparative Characteristics of Goal-Scoring Situations Depending on Players' Positions

Indicators		Forwards (n=108)	Midfielders (n=57)	Defenders (n=24)	Evaluation of Reliability	
		$X_1 \pm m_1$	$X_2 \pm m_2$	$X_3 \pm m_3$	t	p
Goal situations in a match	after central zone interaction	50,7±1,14	25,1±0,57	3,9±0,12	$t_{1,2}$=3,63 $t_{1,3}$=4,13 $t_{2,3}$=2,47	$p_{1,2}$<0,01 $p_{1,3}$<0,001 $p_{2,3}$<0,05
	after flank interaction	15,2±0,32	10,7±0,26	3,3±0,18	$t_{1,2}$=3,56 $t_{1,3}$=4,51 $t_{2,3}$=2,75	$p_{1,2}$<0,01 $p_{1,3}$<0,001 $p_{2,3}$<0,05
	after individual actions	15,7±0,49	8,3±0,27	1,9±0,11	$t_{1,2}$=3,32 $t_{1,3}$=4,72 $t_{2,3}$=2,67	$p_{1,2}$<0,01 $p_{1,3}$<0,001 $p_{2,3}$<0,05
	from set pieces	15,4±0,39	8,9±0,22	7,3±0,24	$t_{1,2}$=3,48 $t_{1,3}$=4,35 $t_{2,3}$=2,55	$p_{1,2}$<0,01 $p_{1,3}$<0,001 $p_{2,3}$<0,05

The obtained data confirm the dominant role of forwards in the finishing phase of the attack. The goal-scoring conversion rate involving forwards after central zone interactions is 50.7, which statistically significantly ($p<0.001$) exceeds the indicators of other lines. Such a concentration of goal-scoring actions in the center of the pitch indicates the high efficiency of forwards in overcoming the opponent's low and medium defensive blocks. In addition to technical skill, this reflects a high level of cognitive skill development: the ability to instantly assess the spatial situation, choose the optimal shooting position, and make extraordinary decisions under time constraints.

Midfielders act as a key connective link, ensuring the transition phase of the game. They demonstrate a balanced distribution of performance between central zone interactions (25.1) and flank interactions (10.7). This indicates the universalization of modern midfielders, who are capable not only of constructing attacks but also of effectively joining the finish in various areas of the pitch. Such a distribution of performance is consistent with modern trends in football, where the functional duties of midfielders require high endurance and tactical flexibility.

Special attention should be paid to the indicators of defenders, who demonstrate a specific performance model. Despite the fact that their overall contribution to creating goal-scoring moments is lower compared to forwards, they show the highest efficiency precisely when executing set pieces (7.3). This confirms the strategic importance of set pieces in modern football, where defenders often become the main targets during corner and free kicks due to their anthropometric data and ability to win aerial duels. Individual actions of defenders in the finishing phase (1.9) remain the least representative indicator, which is a logical result of their primary focus on organizing defense and disrupting opponent attacks.

The reliability of the identified differences is confirmed by the calculated t-tests and significance levels (p) presented in Fig. 1. For most compared pairs of indicators, the significance level is $p<0.001$ and $p<0.01$, indicating the non-random nature of the identified trends. The data visualization in Fig. 1 clearly demonstrates a consistently high significance of differences between player groups (forwards, midfielders, defenders) for all four categories of goal-scoring situations. The range of t-tests from 2.47 to 4.72 confirms the high reliability of the sample, which ensures the scientific validity of the obtained conclusions.

The discussion of the results allows us to assert that the tactical architecture of modern football has undergone significant transformation, demanding from players not only a narrow skill specialization but also a high level of tactical flexibility. The obtained data, presented in Table 1, are fully consistent with modern theoretical concepts of game function differentiation, yet supplement them with precise statistical parameters demonstrating the dynamics of goal-scoring situation conversion in top-level tournaments.

Firstly, the systematic integration of individual skills into a single team interaction model became a defining feature of elite football in 2022–2026. The statistically significant advantage of forwards in the central zone (50.7) confirms that, despite the general trend toward "total football," where every player participates in various attack phases, the finishing stage remains the prerogative of the attacking line. This indicates the preservation of the hierarchical structure of game functions, where the cognitive efforts of forwards are concentrated on finding space and converting chances in the most critical zone.

Secondly, the "unexpectedly high" contribution of defenders to set-piece conversion (7.3) indicates a shift in the tactical paradigm of modern defense. This is not accidental, but a natural result of the evolution of training methodologies, where defenders are increasingly viewed as full participants in the attacking phase, especially in confined spaces. The revealed data (t-tests from 2.47 to 4.72) highlight the need for a significant revision of training preparation programs for defensive line players. In modern training microcycles, the emphasis should be shifted not only to defensive actions, but also to practicing movement algorithms and "working in a crowd" during corner and free kicks, where individual tactical discipline turns into collective success.

Thirdly, the statistical validity of the obtained indicators ($p<0.001$ and $p<0.01$) allows us to speak of established tactical patterns characteristic of modern national team football. This means that the success of converting goal-scoring situations at the 2022 and 2026 World Cups is not so much a product of accidental actions as it is the result of deeply integrated functional preparation.

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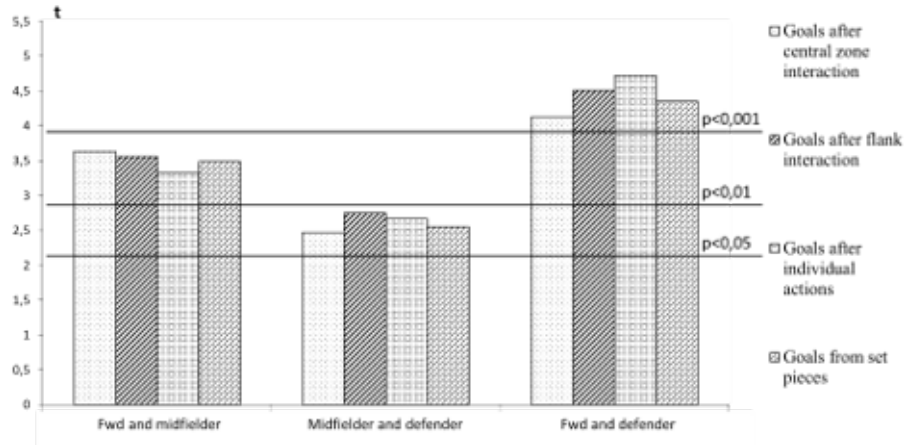


Fig. 1. Numerical values of the t-test and significance levels (p) of goal situations depending on players' positions.

Discussion

The discussion of the obtained results allows us to assert that the tactical architecture of modern football has undergone significant transformation, demanding from players not only a narrow functional specialization, but also a high level of tactical flexibility (Serra-Olivares et al., 2016). The obtained data are fully consistent with modern theoretical concepts of game function differentiation, yet significantly supplement them with precise statistical parameters.

The systematic integration of individual skills into a single team interaction model has become a defining feature of elite football in 2022–2026. The statistically significant advantage of forwards in the central zone confirms the conclusions of other researchers that specific skills and cognitive speed determine the outcome of episodes in the most critical zones of the pitch (Sannicandro et al., 2020). The finishing stage remains the prerogative of the attacking line, which aligns with data regarding the positional specificity of technical requirements in top-level matches (Sarmento et al., 2014).

The revealed high contribution of defenders to set-piece conversion confirms trends recorded in previous scientific research analyzing corner kicks at World Cups. This proves the evolution of training methodologies, where defenders are viewed as full participants in the attacking phase (Tottori & Fujita, 2019; Šunjić et al., 2024). The obtained data emphasize the need to adapt the training process following the example of tactical preparation programs that encompass the comprehensive development of both physical and psychological components of the game.

The statistical validity of the indicators allows us to speak of established stable patterns inherent in modern national teams. Similar trends are also noted in the works of other specialists (Torres-Ronda et al., 2015; Sarmento et al., 2024), who investigate the motor and technical activity of players in the final stages of World Cups, emphasizing the importance of modeling game activity.

Thus, the results of the study provide grounds to assert that the success of converting goal-scoring situations directly depends on a clear alignment of game actions with a player's functional position, combined with a high level of adaptability. This sets new tasks for coaching staff regarding the optimization of training plans. The preparation strategy must be based on the development of specific skills: from stimulating the creative thinking of forwards, allowing them to make non-standard decisions in the central zone, to forming consistent tactical discipline among defenders in the finishing stage of the attack, where their contribution to set pieces becomes a decisive factor in achieving a result.

Conclusions

Summarizing the results of the analysis of 168 matches from the 2022 and 2026 World Cups, it can be concluded that modern football is characterized by a clear functional specialization of players across different lines in the context of creating and finishing goal-scoring situations. Statistically significant data ($p<0.001$ and $p<0.01$) allow us to identify the following patterns:

1. The attacking line remains a key element of conversion in the central zone (50.7), which confirms the high demands on the individual technical skill and cognitive speed of forwards when finishing attacks.

2. Midfielders play the role of a fundamental connecting link, ensuring uniform effectiveness in both the central and flank sectors of the pitch. Their play is decisive for the success of attacking transition phases and creating goal-scoring opportunities for teammates.

3. The defensive line has transformed its role, evolving from a purely defensive unit into an important attacking tool. The highest effectiveness indicator of defenders in set-piece conversion (7.3) proves the necessity of integrating specialized drills for defenders into set-piece training systems.

4. Mathematical data processing using Student's t-test (t-values ranging from 2.47 to 4.72) confirms the high reliability of the obtained results, indicating the objectivity of the identified tactical patterns in modern elite football.

Directions for further research. The obtained results open up broad opportunities for further scientific research in the field of football methodology:

- Cognitive aspect: It is advisable to conduct research aimed at studying the correlation between decision-making speed (cognitive architecture) and the effectiveness of convert-

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ing goal-scoring moments by players of various roles.

- Youth football: Transferring data obtained at the "elite" level to youth football will allow the development of model characteristics for sports school trainees, adapting them to the requirements of modern professional sports.
- Technological analysis: A promising direction is an in-depth study of the impact of opponent tactical pressing on the effectiveness of interactions in the central zone, which will allow coaches to adjust tactical schemes in real-time.
- Load differentiation: The study results can serve as a basis for creating individualized tactical preparation programs that take into account not only players' physical parameters, but also their statistically confirmed effectiveness in specific game zones.

Further development of these issues will optimize the training process at the professional level, ensuring maximum alignment of player game activity with the requirements of top-tier tournaments.

Conflict of Interest

Volodymyr Perevoznyk and Volodymyr Paievskyi are Editorial Board Members of *Sports games*. To ensure a transparent and unbiased review process, they were completely excluded from the editorial handling, peer-review coordination, and final decision-making regarding this manuscript. The other authors declare no conflict of interest.

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