Original Article

EXAMINING OFFENSIVE TACTICAL ACTIONS PERFORMED BY YOUTH SOCCER PLAYERS WITH DIFFERENT COMPETITIVE CONTEXTS

EXAMINANDO AS AÇÕES TÁTICAS OFENSIVAS REALIZADAS POR JOVENS FUTEBOLISTAS DE DIFERENTES CONTEXTOS COMPETITIVOS

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ABSTRACT

The study examined offensive tactical actions performed by U-15 soccer players with different competitive contexts. 34 matches played by three different contexts of U-15 soccer clubs were used; brazilian national (BN), brazilian regional (BR), and italian national (IN). Five categories where used to analyze the soccer offensive actions: "number of players involved" (NJ), "ball touches" (NT), "passes" (NP), "corridor changes" (NTC), and "duration of ball possession" (TRA); the results were coded using Match Vision Studio® software. The BN presented higher values in all five offensive categories ($p < 0.05$) when compared to the IN. Multinomial regression evidenced relative contributions of NJ and NP on the chances of results in the BN. The increase of one player involved in the offensive action decreases by 84% the chances of "total success" with respect to "unsuccessful" ($p < 0.05$). The performance of each additional pass increases 4.9 times the chance of the play ending in "total success" and 4.7 times ($p < 0.05$) in "partial success" when compared to the "unsuccessful" category. The NJ in the action and the NP have a direct influence on the outcome of the offensive actions of the BN.
Keywords: Soccer. Sports performance. Youth sports. Task performance and analysis.

RESUMO

O estudo examinou ações táticas ofensivas realizadas por jogadores de futebol sub-15 em diferentes contextos competitivos. Foram analisados 34 jogos disputados por clubes sub-15 de três diferentes contextos competitivos, sendo estes: brasileiro nacional (BN), brasileiro regional (BR) e italiano nacional (IN). Cinco categorias foram utilizadas para analisar as ações futebolísticas ofensivas: "número de jogadores envolvidos" (NJ), "toques sobre a bola" (NT), "passes" (NP), "mudanças de corredor" (NTC) e "duração da posse de bola". "(TRA); os resultados foram codificados usando o software Match Vision Studio®. O BN apresentou valores maiores nas cinco categorias ofensivas ($p <0,05$) quando comparado ao IN. A regressão multinominal evidenciou contribuições relativas de NJ e NP nas chances de resultados no BN. O aumento de um jogador envolvido na ação ofensiva diminuiu em 84% as chances de "êxito total" em relação a "sem êxito" ($p <0,05$). O desempenho de cada passe adicional aumentou em 4,9 vezes a chance da jogada terminar em "êxito total" e 4,7 vezes ($p <0,05$) em "êxito parcial" quando comparado à categoria "sem êxito". O NJ na ação e o NP tiveram influência direta no resultado das ações ofensivas do BN.
Palavras-chave: Futebol. Performance esportiva. Esportes para jovens. Análise e desempenho de tarefas.

Introduction

Soccer is known as a team sports where the team actions are linked to the opponent's actions, as well as being classified as an invasion game, where the aim is to invade the opponent's space to put the ball in the goal while seeking to defend your own goal. Soccer requires the player to be constantly committed to decision making, where, while players have to observe, process, and evaluate situations, they must also choose and execute the tactical and technical solutions appropriate to a given match situation[1]. Numerous scenarios arise during a match, whose frequency, chronological order, and complexity cannot be predicted, requiring a high capacity of adaptation and immediate response by players and teams to the notions of opposition present in all phases and moments of the game[2]. Social network patterns[3-5], physical fitness[6-8], technical skills[9-11], tactical principle execution[12-14], and psychological attributes[15,16] interact to produce high performance, given the chaotic nature of the game and its complexity[17].

All these complex variables work together to produce high performance. The level of the championship (quality and level of equality between the teams) and the characteristics of the teams (game model) are parameters that interfere in the final result[18]. However, some behaviors, when repeated, form a pattern of events, known as a game model[19]. The game model is defined as the characteristic playing pattern demonstrated by a team during matches[19]. When building the team game model, coaches should consider several factors that operate within a specific context, where each factor is equally important[20]. Characterizing and understanding the playing style of a team in the process of offensive construction can be very useful to help teachers and soccer coaches to verify how players are learning the content that they are working on[21]. Variables such as the number of passes per attack, the actions of passes that precede the goal, the frequency of passes, the percentage of correct passes in the 5 minutes before the goal and in the next 5 minutes, or the combination of touches on the ball prior to the pass can make up this assessment[22-24].

Offensive actions with few passes are more effective to produce opportunities and goals compared with elaborate attacks; registering a higher odds ratio for scoring a goal and creating a scoring opportunity[25]. Although teams using a ball-possession style created more chances of goals, most goals were scored in situations with few pass changes[26]. However, studies indicate that different playing styles when well executed can be equally effective[27]. These variables result in the interpretation of what happens throughout the games, what is regular or repeated behavior, thus being able to find, through analysis of the movement patterns of the game, a differentiation between teams more and less efficient in achieving the objective of the game, the goal.

Most published studies in the literature were conducted with adult football players[22]. Furthermore, evaluation of tactical actions with young players from different soccer schools and competitive contexts is still a poorly investigated topic in the researched literature; studies were not found with this thematic, identifying a knowledge gap. This study aimed to examine different offensive game actions performed by youth players with different competitive contexts and from different soccer schools. The specific research questions were: (a) How do offensive actions performed by youth players with different competitive levels differ? and (b) Which offensive variable can predict the success or failure of the offensive plays in U-15 soccer players?

Methods

Characterization and Sample

Data were collected from 34 video recorded soccer games played by three different contexts of U-15 soccer clubs (Brazilian national, Italian national, and Brazilian regional) during the 2015/2016 seasons. To obtain the videos, the cameras were located on a higher plane in relation to the game plan to facilitate a topographic view of the playing field. The three clubs and parents of the fifty athletes were informed about the procedures to be adopted and signed the free and informed consent term. The project was approved by the local ethics committee (Proc. 1.627.516).

The Italian club weekly routine was composed of three training sessions, generally including regional players that play in the national championship. On the other hand, the Brazilian national club presented in the study included athletes selected from many states of the country and a weekly routine composed of five training sessions, playing national and state competitions. The Brazilian regional team disputed the regional U-15 championship with a frequency of three training sessions per week and a group composition of selected athletes from the region of the club's host city.

Procedure

After filming, only the offensive actions that finished in shooting in opponent's goal direction were selected. To code five offensive actions including: "players involved", "ball touches", "passes", "duration", and "corridor "changes", and three levels of offensive action results including: "total success", "partial success", and "unsuccessful" (Frame 1), we used Match Vision Studio Premium® software, which has been used in studies that performed observational game analysis[28,29]. This software enables the researcher to create the intended categorical matrix to be used. The categorical matrix was composed of variables proposed by Garganta[2] and Almeida, Ferreira and Volossovitch[31], presented in Frame 1.

Frame 1. The categories of offensive actions and results of the offensive actions

|	
Offensive Actions	
Players Involved	Number of players that were involved, touching the ball during the offensive action.
Ball Touches	Total number of ball touches performed by players during the offensive action.
Passes	Total number of passes made with any part of the body that was received by the attacking partner and continued the offensive phase of the team.
Duration	The duration of the offensive phase, from the interception of the ball, to the end of the offensive action (seconds).
Corridor Changes	Number of times that the ball changed field corridors during the offensive action, taking into account the division of the field in 3 corridors (left, central, and right).
Results of Offensive Actions	
Total Success	Finished in goal.
Partial Success	Defense of the goalkeeper or any other player under the goal line; and ball on the beam.
Unsuccessful	Shooting out of the goal.

Source: Authors
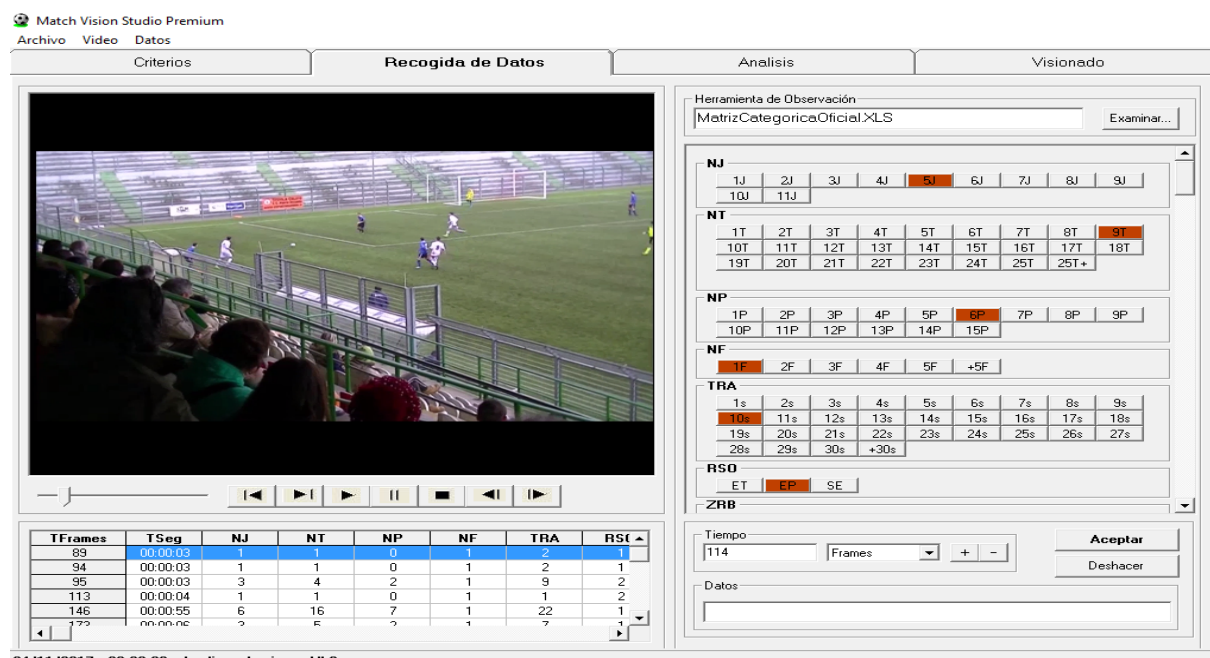
Figure 1. Screen capture from Match Vision Studio Premium® software with the categorical matrix used in the study

Source: Authors

	A Players involved	B Ball touches	C Passing	D Duration	E Corridor changes	F Results of Off. Act.
195	4	13	3	16	4	2
196	3	8	4	9	2	2
197	5	10	4	12	1	2
198	5	14	4	16	3	2
199	4	13	4	17	0	2
200	4	10	5	15	1	2
201	5	14	5	16	2	2
202	6	27	8	35	3	1
203	5	23	8	26	2	1
204	7	20	8	29	7	1
205	9	22	8	30	5	1
206	6	24	8	36	6	1
207	7	20	9	28	5	1
208	8	24	10	32	7	1
209	7	25	10	37	7	1
210	8	29	10	40	7	1
211	8	24	11	26	1	1
212	8	30	11	35	3	1
213	9	19	12	24	5	1

Figure 2. Recording obtained through of Match Vision Studio Premium®
Source: Authors

Statistical Analysis

Data were analyzed using SPSS 23.0 software. Medians (Md), interquartile ranges (Q1-Q3), relative frequencies, and odds ratios (OR) were used to describe the results. The normality of the data was evaluated using the Kolmogorov-Smirnov test ($p < 0.01$ for all variables). Analysis of variance ANOVA and post-hoc Games-Howell were used to compare the offensive actions of the teams evaluated. Next, Multinomial Logistic Regression was performed to estimate the relative contributions of the tactical indicators to the chances of the results of the offensive actions in each of the teams and in total[32]. Regarding data quality control, 21 days after the video analysis, 21% (42 actions) of the total offensive actions were analyzed by an independent researcher and reanalyzed by the main evaluator, aiming to obtain the level of agreement between intra and inter raters. This percentage is required to be higher than that recommended (10%) in the literature[32]. For this purpose, the intraclass correlation coefficient for quantitative variables and the Kappa index for qualitative variables were used, obtaining values situated above $k > 81$ and $r > 0.91$. These reliability values are classified as "near perfect" (0.81 to 1)[31]. The level of significance was set at 5%.

Results

The result of the study showed that the Italian national club performed 137 offensive actions during the 18 matches, while the Brazilian national club performed 63 offensive actions during 11 matches. The Brazilian regional club performed 79 offensive actions during 5 matches. Descriptive values are presented in table 1.

Table 1. Description of tactical performance in offensive actions of U-15 teams (n=279)

	Md	Q1 - Q3
Players Involved (n°)	3.00	2.00 – 4.00
Ball Touches (n°)	6.00	3.00 – 10.00
Passes (n°)	2.00	1.00 – 3.00
Duration (sec.)	8.00	4.00 – 13.00
Corridor Changes (n°)	1.00	0.00 – 2.00

Notes: Md = Median; Q1 = First quartile; Q3 = Third quartile; n° = Number; sec. = Seconds
Source: Authors

Figure 3 presents significant differences in the comparison between the Brazilian national and Italian national club, and it was evidenced that the Brazilian national club presented higher values in the variables "number of players involved" ($p < 0.04$), "number of ball touches" ($p < 0.02$), "number of passes" ($p < 0.01$), "duration of ball possession" ($p < 0.05$), and "number of ball corridor changes" ($p < 0.01$). Regarding the Brazilian regional club, it differed significantly from the Brazilian national club only in the variable "duration of ball possession" ($p < 0.01$), signaling a pattern of faster actions. The results also indicate that, considering the analyzed variables, the Brazilian regional club and the Italian national club presented similar offensive tactical performance.
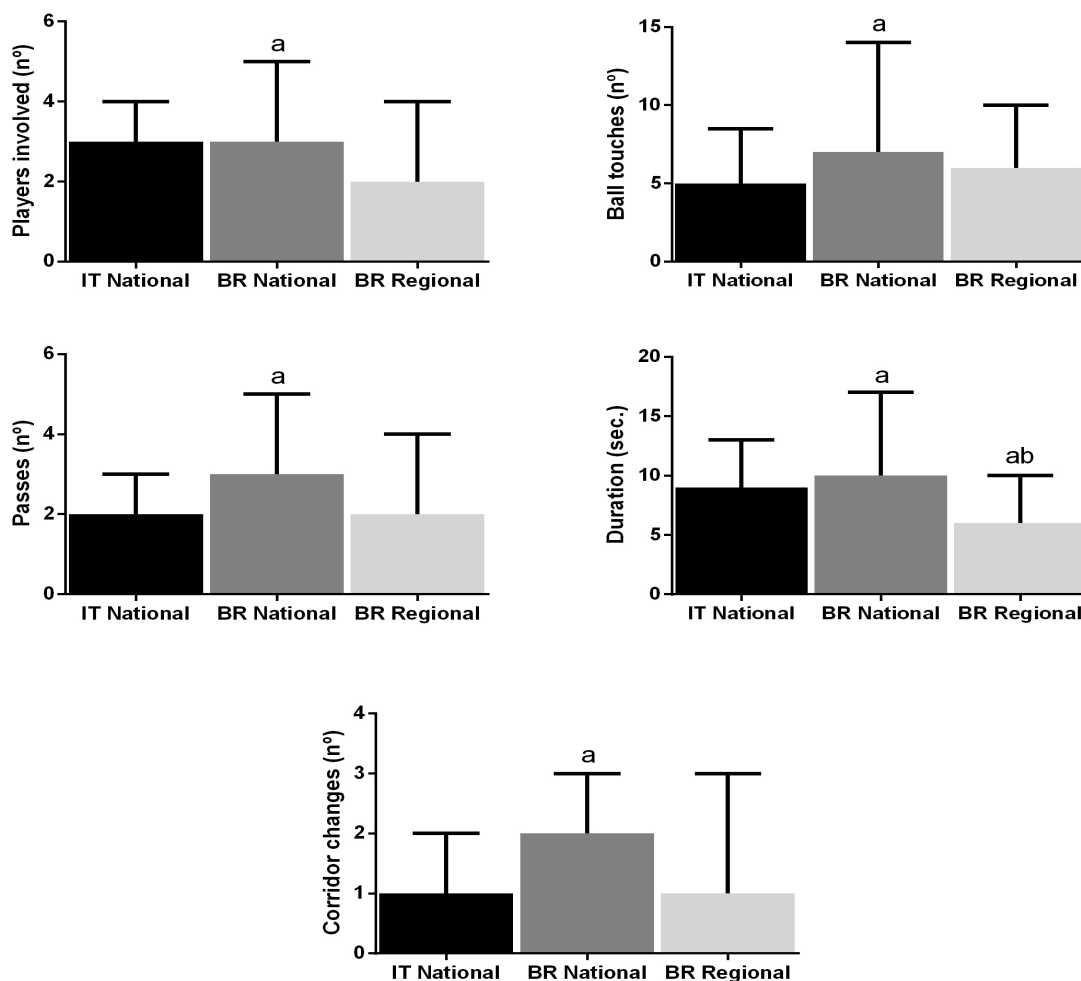
Figure 3. Comparison between tactical indicators executed by U-15 players from different competitive contexts, represented by median and interquartile range

Notes: [a]Significant difference from Italian national group; [b]Significant difference from Brazilian national group. IT National= italian national club; BR National = brazilian national club; BR Regional = brazilian regional club
Source: Authors

Table 2 presents the relative contributions of the variables analyzed on the chances of the results of the offensive actions performed by the U-15 soccer players, with the aim of understanding whether offensive variables can predict the success or failure of the offensive plays in U-15 ages. For the Brazilian regional and Brazilian national club, offensive actions did not have a significant influence on the effectiveness of the offensive actions. Regarding the Brazilian national club, the results show that the increase of a player in contact with the ball during the offensive actions decreases by 84% the chances of having "total success" in the actions compared to the result of the action being "unsuccessful" ($p < 0.05$).

Table 2. Relationship between the result of the action and the tactical offensive performance
of the U-15 teams

	Players Involved	Ball Touches	Passing	Duration	Corridor Changes
Result	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Brazilian regional (79 actions)					
Total Success (n=6)	2.04 (0.20-20.76)	0.44 (0.18-1.06)	0.64 (0.07-5.64)	1.05 (0.50-2.18)	2.42 (0.36-16.07)
Partial Success (n=46)	0.92 (0.27-3.15)	0.87 (0.67-1.13)	0.71 (0.24-2.11)	1.25 (0.93-1.68)	0.82 (0.41-1.65)
Unsuccessful (n=27)	Reference	Reference	Reference	Reference	Reference
Brazilian national (63 actions)					
Total Success (n=19)	0.16 (0.03-0.91)*	0.73 (0.43-1.25)	4.85 (1.18-19.90)*	1.17 (0.85-1.61)	0.92 (0.43-1.96)
Partial Success (n=24)	0.21 (0.04-1.08)	1.46 (0.87-2.44)	4.74 (1.20-18.72)*	0.74 (0.52-1.06)	0.56 (0.26-1.22)
Unsuccessful (n=20)	Reference	Reference	Reference	Reference	Reference
Italian national (137 actions)					
Total Success (n=27)	0.81 (0.42-1.55)	1.25 (0.94-1.65)	1.25 (0.72-2.18)	0.90 (0.73-1.12)	1.11 (0.63-1.94)
Partial Success (n=46)	0.77 (0.36-1.62)	1.22 (0.95-1.57)	1.58 (0.80-3.12)	0.86 (0.71-1.03)	0.73 (0.42-1.28)
Unsuccessful (n=64)	Reference	Reference	Reference	Reference	Reference
Total (279 actions)					
Total Success (n=52)	0.57 (0.31-1.04)	0.92 (0.77-1.11)	1.48 (0.88-2.51)	1.09 (0.96-1.24)	1.01 (0.72-1.42)
Partial Success (n=116)	0.57 (0.35-0.94)*	1.10 (0.95-1.27)	1.58 (1.01-2.46)*	0.95 (0.86-1.06)	0.78 (0.57-1.05)
Unsuccessful (n=111)	Reference	Reference	Reference	Reference	Reference

Notes: OR = odds ratio; *significance $p < 0.05$
Source: Authors

With respect to number of "passes", the results demonstrate that the achievement of an additional pass increases by 4.9 times the chance of the action resulting in "total success" and 4.7 times finishing in "partial success" when compared to the reference category. Finally, when analyzing the teams together, the multinomial regression analysis showed that the "partial success" result is influenced by the increase in one player's participation (43% decrease in odds) and the increase of one pass during the play (increase of 1.6 times the chance) with respect to the category "unsuccessful" ($p < 0.05$).

Discussion

The aims of this study were to identify game model characteristics by analyzing five offensive actions of U-15 teams with three different competitive contexts and their influence on the effectiveness of the offensive actions. The major findings suggest that the Brazilian national offensive actions presented a game model with a positional play style, due to the fact that actions with a higher "number of players involved", "ball touches", "passes", "ball corridor changes", and "duration of ball possession" were observed compared to the Italian national offensive actions, which demonstrated a direct play style with lower numbers in the same variables.

Studies indicate that teams seeking to adopt a positional play style and playing a possession game instead of direct play are usually more successful[27,34,35]. These characteristics are present in the offensive actions of the Brazilian national club, being composed of more "players involved", "ball touches", "passes", and "ball corridor changes", resulting in a longer duration of the offensive action in comparison with the other teams. Despite the proven effectiveness of this offensive model, teams with a more direct play style can also be successful, since they have good game control and are highly efficient when attacking[28], which is seen as a main indicator for successful ball possession[26,34].

In this regard, the results show the difference in the game model and interpretation of the phases of the game between teams of different competitive contexts and with different local soccer cultures. This difference can be explained by the players' ability, coaches' ideas, objectives and structure of the club[2], and by the local soccer culture. In relation to the

similarity in the performance of the Brazilian regional club and the Italian national club, it is believed that the characteristics of the players and the composition of both teams are also similar, as these include, in the majority, "local" players, although they participate in competitions with different requirements.

Regarding the contribution of tactical performance to the result of offensive actions, the multinomial regression showed that the number of players and number of passes are characteristics that contribute significantly to the chances of achieving partial success and total success in the outcome of the actions of the Brazilian national team. It was observed that the increase of one participating player decreases by 84% the chances of total success and that the achievement of each additional pass increases by 4.9 times the chance of finishing in total success and 4.7 times in partial success. The findings reflect that in the reality of this team, it is possible that more explosive plays, in which there is less effective participation of the team as a whole (such as counterattacks or times when there is time pressure, numerical superiority, and the need for sectored offensive actions) reflect in better chances of goal, corroborating with previous studies[26,36].

In this sense, the fast transmission of the ball, associated with the dynamics of the movement of the players, is directly linked to actions that promote the rupture of the effective game space and that, consequently, induce the creation of risk situations to the opposing goal, by requiring greater attention, anticipation, and quick organization by the opposing defensive block, which has to quickly solve the problems proposed by the team that owns the ball[37]. During the transition from the defensive moment to the offensive organization, the objective must be to progress towards the opponent's goal, in a fast and effective way, taking advantage of the momentary disorganization in the positional structure of the opponent[38]. This behavior should be encouraged from the initial categories, as it prevents the player from losing sight of the main objective of the game (the goal), seeking to prevent an exacerbated indirect game[39].

Conclusion

The findings of the present study allow minimization of the existing gap in relation to the investigation of the tactical performance with groups of younger soccer players from different soccer schools and competitive contexts. The results indicate the importance of participation of fewer players in offensive actions in the Brazilian national club, maybe reflecting a faster and sectored attack, as well as a greater exchange of passes between players in the construction of these actions, being that these characteristics could be strictly related to the outcome of the plays.

It is suggested that further studies be carried out analyzing the offensive tactical actions of other categories, in addition to the U-15. Also, futures approaches could investigate populations from other countries, seeking to verify whether the findings of this study resemble other realities, and, associating the tactical efficiency with the offensive methods (fast attack, positional attack and counterattack), contributing to interpret the offensive phase of the game in different competitive contexts.

We assumed as a study limitation the use of only three clubs, being two competing at the national level in their respective countries (Brazil and Italy) and one competing at the regional level (Brazil). However, the results have proved to be relevant for a better filling of the existing gap in relation to studies about success and failure of offensive actions performed by U-15 players from different competitive contexts and soccer schools.

As practical applications, it is suggested that trainers incorporate evidence-based practices (e.g., fewer players involved in the offensive plays with more frequent passes between involved players without adding more offensive players) into teaching/coaching. By considering factors that include specific play sequences, pass routes, directions, or using

spaces, diverse offensive play repertoires should be provided and practiced by players in order to improve their tactical competency in soccer.

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