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Original scientific paper

CURRENT METHODS OF SOCCER MATCH ANALYSIS IN FC SHKENDIJA TETOVO PRACTICAL APPLICATION OF PREPARATION IN SEASON ON WEEKLY MICROCYCLE VIA VIDEO AND GPS BASE OF MATCH ANALYSIS

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Abstract

Football has already developed itself as a manufacturing sector, attracting considerable financial resources and being recognized as a rising business sector by large organizations. Professional football teams invest large sums of money to attain success, which results in significant financial gains. As a result, professional football clubs have well-funded scientific research departments to be as successful as possible. The departments in charge of competitive analysis are also given a lot of attention. With the advancement of technology in the market, a variety of analytic programs have emerged. The depllnet Ametiartment employs visual information through its own company as well as companies that have media rights for sports. Special programs and GPS systems are utilized to assess the motions, scientific, strategic, physiological, and social evaluation of the team and the players during matches and training. This has been accomplished using a variety of ways ranging from real-time observation and commentary to post-game computerized video analysis. Though manual inventory methods have shown to be effective and available, the psychometric properties are dependent on a variety of factors, including the number of observers used, their cumulative experience, and the standpoint from which they observe. (Barris and Button, 2008; De la Vega-Marcos, Del Valle-Díaz, Maldonado-Rico and Moreno-Hernández, 2008), and requiring a long time to collect and analyze the data (Di Salvo, Collins, McNeill and Cardinale, 2006). There are works on the technical-tactical component of the game, while others have concentrated on the assessment of physical and/or physiological effort, as well as the social and psychological part, among the research that examines the indications of the player's performance throughout the game (Reina-Gómez and Hernández-Mendo,2012). In this presentation, we will examine the research to date and offer a practical overview of competition preparation and organizing a weekly training process as a contribution to reducing the gap between theory and practice, following the global trends in competition analysis.

Keywords: Soccer, Match Analysis, Monitoring, Practical application

1. Introduction

Science knowledge helps coaches and trainers in making decisions and making judgments in terms of preparation. The information can be utilized to discover strengths and flaws within one's team. We can use data to counter opposing strengths and expose flaws in opposition.

Game assessment can also be used to determine whether or not effective training enhance actual performance. (Carling et al. 2005).

The data is extensive and the coach will be unable to recall it all throughout the game. (Franks and Miller 1986) showed that just 30% of the main characteristics that impacted effective soccer performance could be remembered by international level soccer coaches.

According to another study, coaches can only recall about half of the major instances. (carling et al. 2005).

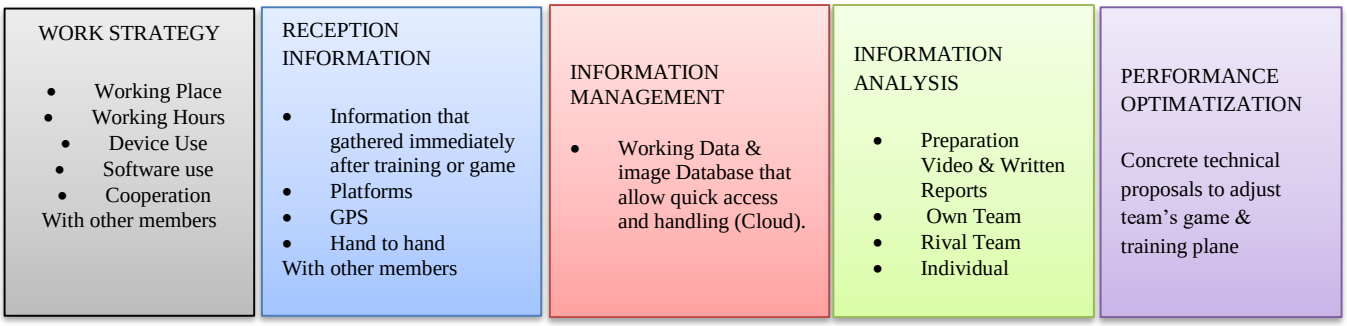
Additional factor would be that the trainer may not be able to accurately obtain the information. (Neisser 1982)

Articles published in research publications, which post papers for professionals and typically do not pay for submissions, might assist a person in a variety of ways. These articles are likely to help in grow within one`s profession, expand the professional opportunities and take questions on one`s ideas, among other things.

The majority of papers presented to journals are extremely long, and they are frequently denied or withdrawn with a demand for significant revisions. A presentation may be rejected for a range of factors, including the value of the project as well as the quality of presentation. While both the integrity of the job and the presentation are crucial. (Singh et al, 2002).
Notational analysis and motion analysis are the two types of match analysis available.
Notational analysis is a method of collecting actions in order to have a precise and accurate record of what occurred. (Carling et al. 2005). Motion analysis is another type of match analysis that is based on the fundamental characteristics of a person's action and motion. (Carling et al. 2005).
This could indicate the work rates of athletes in multiple positions as well as the lengths achieved during a game. (Reilly and Williams 2003).
Such method can be used to detect exhaustion and distinguish between positioning changes in work pace and athletic ability levels. (For example, defenders need to be able to maneuver rearward and sideways.) (Carling et al. 2005). In this discussion, we will examine the research to date and offer a practical overview of competition preparation and organizing a weekly training program as a contribution to reducing the space of concept and action, due to the global trends in competitive strategy.

2. Getting ready for weekly planning and implementation, including how to thoroughly examine it

In this post, we reveal how FC Shkendija Tetovo, a team from the North Macedonian First League, conducts game analysis and a weekly training microcycle. Throughout the competition seasons, the plan and program within our team's workweek use the following process flow:



2.1. Work strategy

- Working Place
- Working Hours
- Device Use
- Software Use
- Cooperation

So that we may start with the evaluation, we require better content for a trustworthy and functional capture instrument. Researchers have gathered the content of our club unit, our drone for operational assessment, and our own correct camera with Artificial Intelligence recording Veo for match and training performance evaluation.

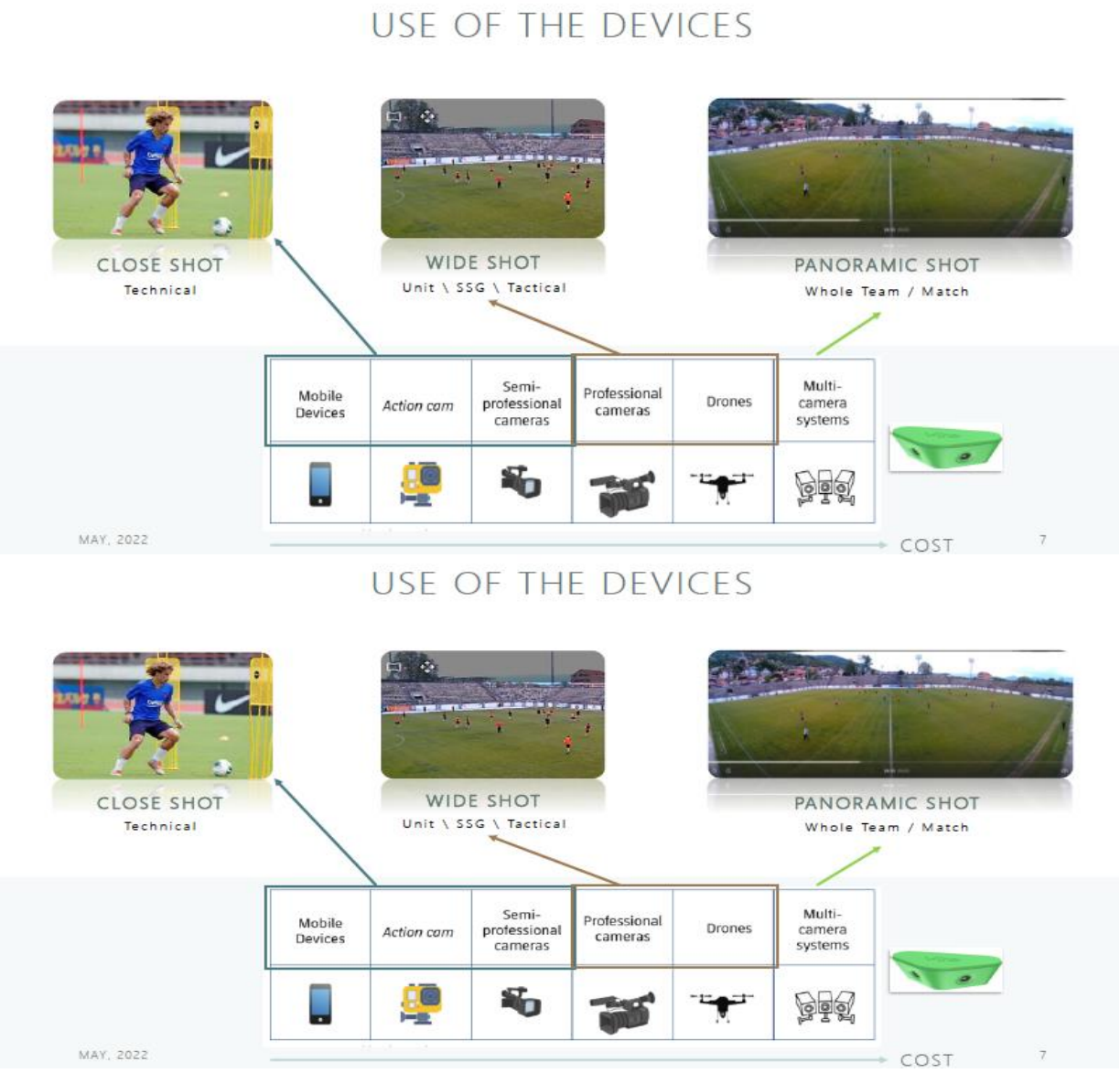


Fig. 1

Including web platforms such as FFM, InStat, Wyscout, and Physical Drive, we employ software to acquire videos and information. We controlled these materials using web and hardware objects after getting the video footage. Once uploading video data, we could begin evaluating, scientific, and technology trends by modifying and creating videos using Da Vinci solution, Instant Tool, Klip Draw, The Coach Platform, Tactics, Manager, Word, Excel, and lastly preparing for PowerPoint presentation and digital screens.

Fig. 2

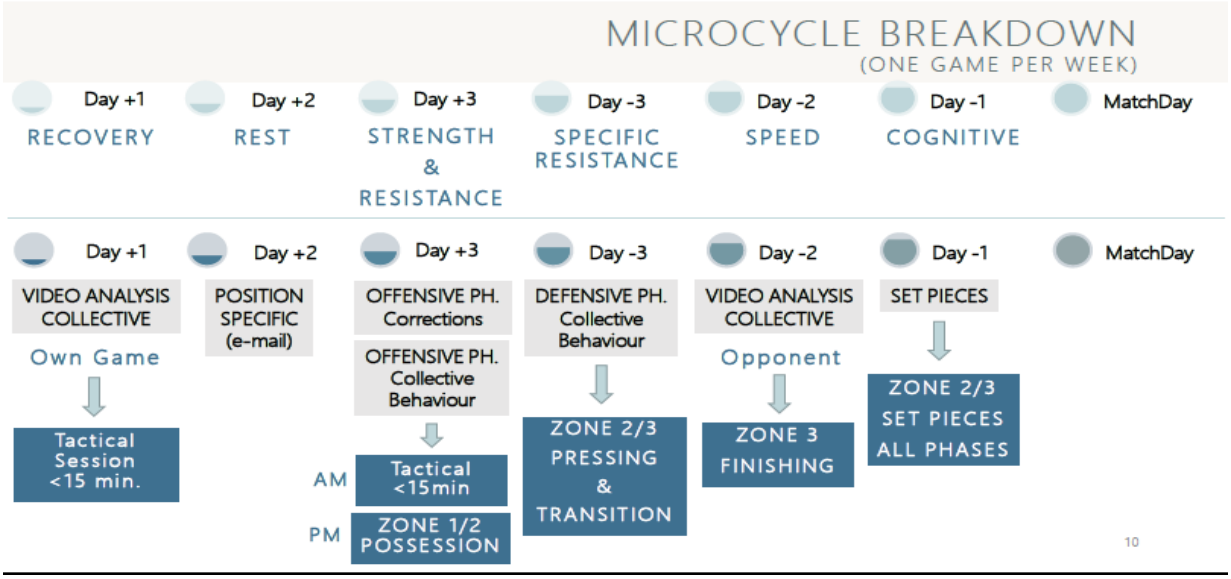


Fig. 3

Following the performance evaluation, we create and execute a weekly microcycle. A day for rehabilitation and rejuvenation is set aside 48 to 72 hours following the competition. During this time, we employ regeneration equipment and moderate exercise. In our example, day +1 and day + 2 are frequently used. From a physiological standpoint, Day + 2 to be an off day because the maximum of DOMS (Delayed Onset Muscle Soreness) impacts and exhaustion occurs on the second day after the match. On Day 2, we'll have a sprint workout and a video monitoring session with the opposing team. During day one, we engage on mental activities, set pieces, and game strategies for the next opposing side.

3. Discussion

The teammate's activities were categorized as per the motion during the first motion assessment, which was initiated from the assumption that exercise intensity was determined by the distance covered. The major ones were walking, jogging and running fast, as well as other movements such as running backwards or multiple

ball actions. (Reilly, 2005). Additional early projects include (Mohr et al, 2003; Krustrup et al, 2005; Randers et al, 2007) Whereas the programming of motion parameters is browser-assisted, had also proceeded to use the time transferred by various sources of the playing field to determine the output velocities, while its ultimate proximity traveled is gained from the overall duration and the total velocity of both of the classifications.

A method known as manual data entry has been employed in the past. (Knowles and Brooke, 1974, and Whitehead, 1975, in Stølen et al, 2005). To provide it, the viewer had to mark down the teammate's motions on millimeter sheet, then transfer them to a spreadsheet with a rough guess of the true length to get the player's path. This non-invasive technology allows for the tracking of a player's performance throughout a match by recording, on one side, the total distance and estimated energy consumption and on the other, the sprinting, velocity, length, and regularity. TrackPerformance® (SportsTec Pty Ltd., Sidney, Australia) is a modern method capable of extracting the distance covered by the player with an inaccuracy of less than 5% to use a mat and digital pen linked to a regular computer and prior marks on the court to adjust the program. (Burgess et al, 2006). The movie film was one of the several devices and measurement resources utilized to acquire data (Van Gool et al, 1988), the video camera (Bangsbo et al, 1991; Helgerud et al, 2001; Castagna et al, 2003; Mohr et al, 2003; Shiokawa et al, 2003; Krustrup et al, 2005; Bangsbo et al, 2006; Bloomfield et al, 2007a; Randers et al, 2007) or trigonometry (Miyagi et al, 1999; Ohashi et al, 2002). Computer-aided motion estimation is becoming highly popular as a result of recent technology advancements that make it feasible to gather and interpret data in real time swiftly and accurately. Traditional systems are being supplanted by systems based on automatic image tracking (vision-based motion analysis, automatic tracking system) and/or computerized time-motion analysis (computerized time-motion analysis, computer-based tracking).

Furthermore, there has not been a consistent standard across the numerous research that have employed a traditional approach to classify motions or proceed with their recording. As in this regard, Zubillaga (2006), in consensus with Castellano et al. (1996), argues that the research have produced contradictory findings as a result of one or more of the following occurrences: features with a wide range of properties in proportion to the sample size and composition; increased variability in evaluating the density of the player's dislocation; great variance in enrollment procedures and methodologies, with an unfair characterization of the player's role within the team's gaming platform and no examples to the specific context of engagement in which the match occurs; or a poorly constructed reasoning about the instruments' stages of validity and reliability. The use of GPS is a modern technique for evaluating the player's motion even during the game, that is a navigational system which allows for the acquisition and the location of an instrument or a person that can be determined using a connectivity of satellites that orbit with synched pathways over the entire surface of the Earth. Multiple sources have referenced the dependability of the system to be used in the engaged physical workout in every one of the receiving settings: “nondifferential GPS” (Witte and Wilson, 2004; Townshend et al, 2008; Macleod et al, 2009), “differential GPS” (Schutz and Herren, 2000; Terrier et al, 2001; Terrier and Schutz, 2003) and “WAAS-enabled GPS” (Witte and Wilson, 2005). The GPS, with a heart rate sensor and an accelerometer, in team sports, it is used to accurately measure the training intensity as well as the various types of deformations and kinesics in actual time (Edgecomb and Norton, 2006; Barbero-Álvarez and Castagna, 2007; Rupf et al, 2007; Macleod et al, 2009; Duncan et al, 2009; Barbero-Álvarez et al, 2010; Coutts and Duffield, 2010), as well as in soccer (Hewitt et al, 2007; Pino et al , 2007; Barbero-Álvarez et al, 2008; Harley et al, 2010; Randers et al, 2010; Harley et al, 2011) Whereas the benefit of this system is the ability to measure each player's motions and the intensity with which they are executed in real time and also the ball's projections, The disadvantage is that the devices with which the player must be prepared are not permitted by FIFA (Fédération International de Football Association) regulatory frameworks, this makes it difficult for experiments that use this procedure to implement it in approved football games, restricting its use to practice sessions and friendly games. Correlated to this is the existing advancement of technological tools, with a growing amount and effectiveness of programming and assessment software. (Noldus et al, 2000; Courtney, 2002; Dabanch et al, 2002; Shiokawa et al, 2003; Jonsson, 2004; Jonsson et al, 2004; Castellano et al, 2005; Perea, 2008; Castellano et al, 2008a), as well as image acquisition and digitization devices (Ohashi et al, 2002; Ekin et al, 2003; Wan

et al, 2003; Ren et al, 2004; Wang et al, 2004; Xu et al, 2004; Leoand et al, 2005; Ren et al, 2006; Gedikli et al, 2007), allows effective surveillance of own players' and opponents' personal and group activities during matches, as well as the movement patterns of the referee and the ball (Weston et al, 2011). In contrast, many experts suggest that since a completely independent system has not yet been promoted, this image tracking system implemented to team sports demands much farther advancement. Referring to Barris and Button (2008), deformations and movement patterns involving abrupt course corrections or interaction between players disregard the "clean movement" model upon which the DLT (Direct Linear Transformation) algorithms rely (Shiokawa et al, 2003) as a result, mechanical modifications are necessary to analyse the information after it has been recorded. Reilly (2005) additionally claims, regardless of the fact that several professional football teams are integrating this new tech, its dependability has not been officially incorporated, and minor errors in data gathering can have a significant impact on its analysis. Eventually, Edgecomb and Norton (2006) have discovered that ranges documented by computer controlled video analysis are overstated by 5.8 percent, while GPS distances are exceeded by 4.8 percent. As a comparison purposes, consider the work of Randers et al. (2010), in which they investigated the occurrence and fatigue advancement of 20 soccer players during a match, contrasting the outcomes of four systems: one mechanical video analysis of time motion (VTM, Bangsbo et al, 1991), a different semi-automatic (AMISCO Pro®, Nice, France), and two GPS receivers, with a resolution of 5 Hz (MinimaxX® v2.0, Catapult, Scoresby, Australia) and of 1 Hz (SPI Elite®, GPSports, Canberra, Australia) respectively. The processes used identified a significant decrease in the player's distance covered during the first and second halves together in the game ($p < 0.001$), as a result, all of them appear to be dependable for analyzing game structures. Moreover, there have also been major differences in the ultimate values provided by each for the distance covered at varying speeds, a factor to take into consideration when making comparisons evidence from multiple systems. Equally, Harley et al (2011) during the match, six professional players varied significantly in their running speeds ($p < 0.05$) when attempting to compare the output of a semi-automated video system (ProZone Sports Ltd., Leeds, UK) and a GPS receiver (MinimaxX® v2.0, Catapult, Scoresby, Australia). Besides this, due to the greater benefits offered by an automatic system over a manual one, this methodology is being used in an increasing number of football studies (Zubillaga, 2006; Barros et al., 2007; Di Salvo et al, 2007; Rampinini et al, 2007; Zubillaga et al, 2007; Bradley et al, 2009a; Bradley et al, 2009b; Di Salvo et al, 2009; Pleština et al, 2009; Rampinini et al, 2009; Carling, 2010; Vigne et al, 2010; Castellano et al, 2011; Redwood-Brown et al, 2012). fewer than eight movements to describe in precision the complicated features that makes today's physical requirements of sport. Furthermore, traditionally, researches have focused on gathering the occurrences, average and specific value of individual motions, according to these same author, nevertheless, the distinct physiological requirements that these motor activities generate are not identified. The Bloomfield Movement Classification or BMC (Bloomfield et al, 2004), in this context, a verified time-motion analytical method for team sports such as football has been suggested. (Bloomfield et al, 2007b), there are 14 different types of movement with periodic registration, 3 different types of simultaneous movement, 14 different directions, 4 different strengths, 5 different rotational categories and 7 different movements on the ball. Other times, the goal of a study is to assess a player's and a team's strategic technical performance rather than their physical and physiological aspect, in which case all these so observant method is a viable alternative. (Castellano et al, 2008b). As a result, and based on the experimental model used, this method enables the analytical method to be chosen. The researchers of this new model of football research focused their research on a sequential analysis of interruptions. (Ardá and Anguera, 2000; Silva et al, 2005), or with the aid of an integrated navigation analysis program (Castellano and Hernández-Mendo, 2003), following the creation of a classification that specifies field structures and categorization methods for game observation. When it comes to football research, empirical research studies on tracking the regularity of movements have always been the norm, the time factor was then included, allowing for a progressive examination and the identification of behavioral traits, characteristics that the empirical analysis is based on. Football movements are performed frequently, a feature that can be discovered if they're kept track of in a methodical manner, as a result the large quantity, speed and diversity of similar

arrangements observed, soccer players' movements has to be more regulated than they appear at first appearance. (Anguera, 2004). Among the various software applications for empirical analysis that are currently available, ThemeCoder® (PatternVision Ltd., Reykjavík, Iceland) is an encoding computer application that runs after receiving digital recordings and produces data that may be integrated into the Theme program.® (PatternVision Ltd., Reykjavík, Iceland), The technique created by Magnusson (1996, 2000) was then utilized to identify temporal sequences (T-patterns). Consequently, T-patterns' key achievements have been to promote the detection of specific sorts of temporal structures in activity, that are impossible to identify by using conventional analytical tools (Borrie et al, 2001; Borrie et al, 2002) and particularly important in the study of group sports such as football (Anguera, 2004; Bloomfield et al, 2005; Jonsson et al, 2006). Similarly, The Observer® XT (Noldus Information Technology, Leesburg, VA, USA) SOF-CODER® (Jonsson, 2004), Match Vision Studio® v.3.0 and SOCCAF® v2.0 (Perea, 2008), or MOTS® (Spanish et al, 2008a) are software that are used to do observational research.

4. Conclusion

Currently and based on the qualities of the soccer player analysis that will be conducted, wherein technical-tactical performance is typically distinguished from physical-physiological performance, there seem to be a diversity of business choices tailored to individual requirements. Therefore, in regard, the methods can be distinguished on the basis of player surveillance that occurs throughout the game and/or training: via GPS, along video recording and processing, as well as computer-assisted automatic content recording. In football practice, GPS is a solid and verified technique for assessing training intensity and documenting various sorts of activities and body motions in actual time, Yet, since it cannot be included into the apparatus during formal events, its usage is limited to the areas of training. As for them, programs for manual video processing and generation, suitable for both conventional and experimental research, seen as a system of representation, actual monitoring of actual movements and player activity is greatly simplified. Their outcomes, however, may differ and could be influenced by the observer's attitude and level of expertise. Although computer-assisted motion assessment and automatic content tracking technologies offer significantly more physical and technical-tactical data on players and opponents in actual time, professional football clubs have tried to implement it. Nonetheless, this method has several disadvantages, including its high resource and time expense or the requirement for physical modifications in some circumstances due to a lack of accuracy. The reason that none of the methods under discussion can be called the standard for player and match evaluation, as their dependability and efficiency weren't always confirmed, particularly in those studies to examine the sprinting lengths and velocities, combined with the lack of a universally accepted standard for distinguishing and documenting motions and activities, imply the necessity to keep improving a system that appears to be in its early stages. North Macedonia's effectiveness analysis relies on global market trends, but it is also influenced by the club's financial budget, which is too minimal in comparison to European clubs. Advanced performance analysis methodologies should be used by professional soccer clubs, strong collaboration with universities, where they may be able to locate volunteer and professional personnel for their own research institutions. Consequently, match investigation in the future it is to be established by new metric criteria for game assessment. Applying artificial intelligence for rapid information analysis and conclusion-making data sets might be performed continuously.

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