

The Statistical Analysis of the Game Actions of the Middle-Blocker Based on the Application of the “Data Volley” Software

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Abstract: The purpose of the present study is to increase the action efficiency of the center players in the Arcada Galați Club by using the “Data Volley” Software, analysing the attack and defense of our own players, as well as the analysis of the opponent centre players participating in the national senior volleyball championships.

As coaches of the Arcada Galați team it was possible for us to access the tracking statistics of 24 centre players participating in the 2018 National Senior Volleyball Championships and evaluate our own centre players in relation to the national level statistics, as well as the actions within the team.

In the ample statistics for each play action, rotation, upon analysing 18 matches (stage I-III) we observed the efficiency of the serve and attack at national level as 43% and 36% respectively, as compared to 48% and 43% as it was recorded for the average centre in Arcada Galați. The differences of 5% for the serve and 7% for the attack over the national level point to an advantage in the attack phase. The centre play’s low blocking efficiency of 10% as compared to the 40% national average was the point of interest in the technico-tactical training for a three-month period, so that based on the distribution of the opponents’ passes/attacks an improvement of 8% was achieved in comparison to the initial analysis of the defense phase.

Keywords: *statistics, middle-blocker, game actions, software, Data Volley.*

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1. Introduction

In the last years, volleyball has developed a lot and became all the more popular and loved in the entire world. Throughout time, many rules of the volleyball changed, as this sport became more and more attractive and spectacular for the watching public and more (Cojocaru & Cojocaru, 2015; 2019; Holatka et al., 2019). In the training process of volleyball players, at all levels, the specialists came up with a series of experimental methodologies, meant to increase the level of sportive performance of the players (Tilp, 2017; Ungurean & Puni, 2019). Nowadays, when the society is ever-growing, all the more digital technologies have appeared, in all fields, including in the performance sports.

The Data Volley programme of statistical analysis is a software used internationally by all the top teams and more, being used with great success also in the National Championship of volleyball in Romania. One of the main game positions in the volleyball is that of the Middle-Blocker, who has a very important role inside the team as a whole, first as concerns the anticipation of the attack from the other team and the active participation in the offensive actions of his team (Data Volley, n.d.).

It is not by accident that many experts resort to using technical machines or different informational technologies in the process of training sportsmen (Cojocaru & Cojocaru, 2015; 2019; Holatka et al., 2019; Mocanu et al., 2021). In order to achieve a very high level in professional sports, the teams must be flexible, with a technical-tactical game basis with which to be familiar and which can be used with the majority of opponents (Costa et al., 2014; Lobietti, 2009; Savu & Moisescu, 2017).

2. Problem statement

At the moment, the high-performance volleyball is played at a very advanced level, due to the speed and dynamism with which the game actions take place. In order to play at such a level, the players must have a varied number of technical-tactical tools so as to cope with the speed of the game phases, regardless of the adversary he has to face (Miskin et al., 2010; Patsiaouras et al., 2010; Silva et al., 2014). Since the game level in our championship has not yet reached the level of the international one, we wish for an increase of the efficiency in the game for each game position in turn, and implicitly, a growth of the volleyball level in our championship, using the new methodologies of statistical analysis of the game actions (Chen & Chu, 2021; Costa et al., 2014; Liang et al., 2019)

For a better efficiency of the Middle Blocker within his team, we are going to analyse the main technical-tactical elements characteristic for this position, both statistically and using the video images, with the help of the Data Volley software (Data Volley, n. d.; Liang et al., 2019; Patsiaouras et al., 2010).

3. Research questions/Aims of the research

In this study we are going to analyse the game actions of the Middle Blocker, one of the basic positions in the volleyball game, having an important part in the ensemble of the team, mainly as concerns the anticipation of the attack of the opposite team.

In the high-performance volleyball nowadays, the statistical analysis of the game actions during the official games has become a regular practice. The purpose of this study is to improve the individual sportive performances of the Middle Blocker, as well as those within the team. For a more relevant analysis, we are going to analyse the game actions of the Middle Blocker by using the Data Volley software in the official games of the Male National Volleyball Championship in Romania.

4. Research methods

The Data Volley programme of statistical analysis is a software used internationally by all the top teams and more, being used with great success also in the National Championship of volleyball in Romania. The selection and assessment of the players by statistical data using the Data Volley software allow us to rapidly transform what we see (the general abilities put into practice by the players) into a standard code which is then analysed by computer (Cojocaru & Cojocaru, 2015; Data Volley, n. d.)

In figure 1, we have an example of statistical analysis, on each player in part and each ability of the performed technical element.

This software comes also with a system of analysis and video assessment, under the name of Data Video and was designed to simplify the work of coaches in the analysis of one's own game, but also of the opponent team.

With the help of this system, we can make up video montages with the actions of each player in part or of the entire team, depending on the requirements of the coach. Data Video helps us with:

- the analysis of the correct performance of the technical and tactical elements of the players;
- studying the opponents;

- creating some montages with relevant actions in order to highlight the opportunities the players have;
- statistical data in real time;
- video data in real time.

Total Analysis by Skill - 01 Skill details

(10) CSM C, CSA S, CS St, SCMU, ACS V, VCM L, Linde, CS Un, CS *U, Linde

Cs Arcada Galati | Player detail | Skill detail

	Skill	%E%	Tot	=	%	/	%	-	%	!	%	+	%	#	%	
16	DEJ 0-3	-														
18	ZAL 0-3	Serve	1	1	100%											
C 23	CTA 0-3	Serve	64%	11	2	18%		2	18%	3	27%	3	27%	1	9%	
C 24	CTA 0-3	Serve	82%	11	1	9%	1	9%	1	9%	5	45%	3	27%		
P 26	CJ 3-1	Serve	69%	13				4	31%	3	23%	6	46%			
	Total	Serve	69%	36	4	11%	1	3%	7	19%	11	31%	12	33%	1	3%
	Skill	%E%	Tot	=	%	/	%	-	%	!	%	+	%	#	%	
16	DEJ 0-3	Attack	-100%	1		1	100%									
18	ZAL 0-3	Attack	100%	1										1	100%	
C 23	CTA 0-3	Attack		8	2	25%		4	50%					2	25%	
C 24	CTA 0-3	Attack	50%	4				2	50%					2	50%	
P 26	CJ 3-1	Attack	25%	8		2	25%	1	12%			1	12%	4	50%	
	Total	Attack	18%	22	2	9%	3	14%	7	32%		1	5%	9	41%	

Figure 1. Model of statistical analysis of the actions for each player in part
Source: Authors' own conception

One of the basic positions in the volleyball game is the Middle-Blocker, this being a very important position in the ensemble of the team, first in what concerns the anticipation of the opponent team's attack. This thing highlights the strategic positioning of this player in the field and the fact that one of his main responsibilities is blocking. It is the player which from a tactical point of view builds up the blocking together with the side players, in order to stop the attacks of the opponents or by a correct positioning in blocking, he offers his teammates in the defence line the possibility to shine.

Another element characteristic for the Middle-Blocker is the special attack which he does, called first tempo. The 'first tempo' attack is an action in which the Middle-Blocker has to jump exactly at the moment when the opposite does the set, so that he can perform a very swiftly, but also surprising attack, or can create space for his own teammates. The third technical element we are about to analyse is the service.

For an efficiency as good as it gets of the Middle-Blocker within his team, we shall analyse the main technical-tactical elements characteristic for this position, with the help of the Data Volley software.

In order to find out the level where the Middle-Blocker are and what was their contribution within the teams in the A1 Division Championship in Romania, we made a study nationally, of which we selected the main technical elements that interest us about the Middle-Blocker: the service, attack and blocking.

Table 1. The statistics of the Middle-Blocker nationally

Game position	Technical elements	Eff.	Total	Err.	%	-	%	+	%	Points	%
Middle Blocker	Service	43%	838	89	12%	375	44%	208	25%	33	4%
	Attack	36%	585	47	11%	96	17%	76	13%	322	53%
	Blocking	40%	588	79	13%	16	3%	154	24%	213	40%

Source: Authors' own conception

After we found out the game level nationally, we made a minutely analysis of the Middle-Blockers within the C.S. Arcada Galați team so as to determine if our players are at the level of the current team in the A1 National Division. Our objective in this study is to analyse and identify the deficiencies of the Middle-Blocker and to find out the necessary instruments to improve the game within the team (Table 2).

Table 2. The statistics of the Middle-Blocker within the club team

Game position	Technical elements	Eff.	Total	Err.	%	-	%	+	%	Points	%
Middle Blocker	Service	48%	92	6	7%	13	45%	25	29%	3	3%
	Attack	43%	48	4	11%	11	22%	6	9%	26	56%
	Blocking	10%	43	19	39%	7	13%	4	12%	13	37%

Source: Authors' own conception

For the analysis of the Middle-Blocker, there were selected 3 official games for each player in part, both for their assessment nationally, as well as for the analysis of the Middle Blockers within the C.S. Arcada Club.

Taking into account the results, as well as the statistical averages of all the Middle-Blockers in the Senior Volleyball Championship of Romania, we can notice that the level of the Middle-Blockers of the C.S. Arcada Club is very good only from the point of view of certain technical elements.

Analysing the efficiency of service and making a comparison nationally, where the efficiency is of 43%, we can notice a difference of 5% over the national average, the efficiency of the Middle-Blockers for the club team being of 48%. Which means that at this chapter, the Middle-Blockers of the Male Volleyball Club in Galați are above the average of Middle-Blockers nationally. We should also mention the fact that the male volleyball team of C.S. Arcada Club is a top team, which has very good players, hence resulting an efficiency above the national average, for this technical element.

Another technical element specific for the Middle-Blockers is the 'first tempo' attack. We notice that the average of efficiency of the attack nationally is of 36%, whereas the average of Middle-Blockers within the club team is of 43%. The difference here of 7% is also a very important one, showing us a very efficient game as compared to the average of Middle-Blockers in the championship. This thing also confirms us that for this technical element the players are above the average level in the Volleyball Championship of Romania.

The last technical element analysed by us, but also the most typical of the Middle-Blocker position, is the blocking. As we can notice, the efficiency of the Middle-Blocker nationally is of 40%, which represents a very good percentage, but as concerns the efficiency of the Middle-Blocker players of the Arcada Galați club team, this is of only 10%. For this technical element, the percentage is much more below the level of Middle-Blockers in the National Championship of A1 Division Male Volleyball.

5. Findings

Taking into account those mentioned previously, the conclusion is that blocking is the technical element on which we should focus our attention more at this moment, but under no circumstance we should ignore the other two technical elements specific for the Middle-Blocker. In order to have a constant record of the efficiency of players within the team, we should constantly analyse each official or friendly game.

In this context, so as to identify what was the cause of the poor evolution in blocking of the Middle-Blocker, we resorted to Data Video, the system of video analysis. Of the three official games, we selected separate montages with all the actions in blocking of the Middle-Blockers (Fig. 2).

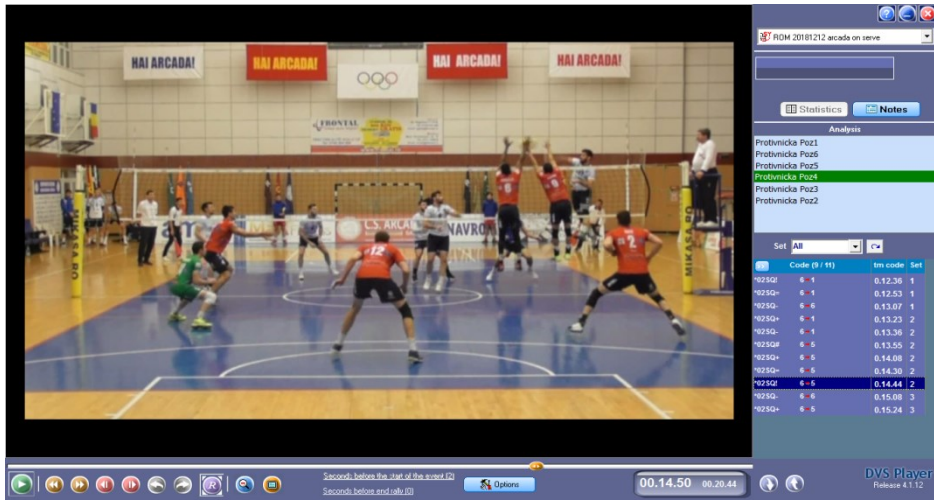


Figure 2. Montage during the official games
Source: Authors' own conception

Table 3. The statistics of the Middle-Blocker within the club team after 3 months

Game position	Technical elements	Eff.	Total	Err.	%	-	%	+	%	Points	%
Middle Blocker	Blocking	18%	115	13	11%	16	14%	25	22%	50	43%

In the volleyball of great performance, the statistical analysis of the game actions during the official or friendly matches nowadays, has become a regular and absolutely necessary practice. This thing highlights the strategic positioning of this player in the field and the fact that blocking is one of his main responsibilities, that is playing in the defence. Analysing minutely, both by video, and by statistics, each game action of the Middle-Blocker player, as well as his activity within the sports training sessions, we noticed that we can improve his contribution from a tactical point of view within his team, during the official matches.

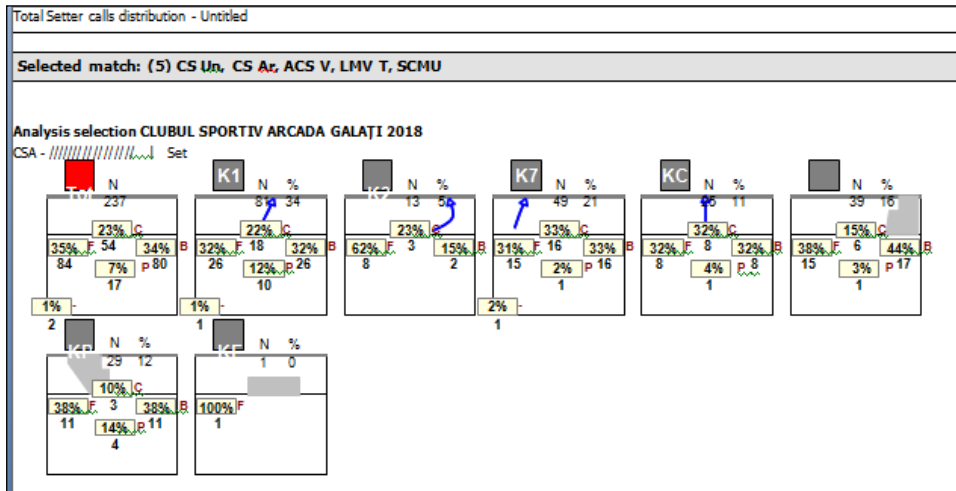


Figure 3. Model of analysis on the distribution of the opponents' passes/attacks to improve blocking efficiency
Source: Authors' own conception

6. Conclusions

In the ample statistics on each play action, rotation, upon analysing 18 matches (stage I-III) we observed the serve efficiency at a national level-43%, and compared it to the level of the Arcada team, where the efficiency is 48%, i.e. a difference of 5% over the national average, which is a real advantage in the attack phase.

Analysing the average attack efficiency in the other teams' centres, we observe an efficiency of 36%, i.e. a 7% difference as compared to 43% for the average centres in the club team.

Following some repeated views of the montages offered by the Data Video system, the conclusion was that the blocking of the players in the Middle-Blocker position did not work for several reasons:

- delayed speed response,
- faulty movement in the side positions,
- wrong action of the arms, from a technical point of view,
- the entire failure to observe the tactical directions.

In regard to blocking, the efficiency of the centre is 40% at a national level, but the efficiency of the centres in the Arcada Club Galați, it is only 10%.

These findings regarding the efficiency of the serve, attack and block on each play action, rotation, set and match outlined the deficiencies of the

centres in our team, and based on the analysis of the opponents, the distribution of the opponents' passes, new attack phases were introduced in the training session, according to the specifics of play.

The final analysis performed 3 months since analysing, recording and comparing the actions of the opposing centres for blocking actions, revealed an 8% efficiency improvement in the Arcada Galați centres' play efficiency in relation to the initial analysis

Identifying these four factors which led to a low efficiency of the Middle-Blocker in the blocking during the official games, we acted consequently so as to optimize the actions in blocking of these players.

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