

Computer Version of an Upcoming Match in Handball

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Abstract

Modern handball is still evaluated by the criteria of 50 years ago. They are full of the report on the work and preparation of the national women team of Russia in handball for the World Cup 2017 in Germany. A lot of unrelated secondary parameters (height, age, accuracy of shots) can be replaced by a computer version of the upcoming match based on innovative PIRS technology. The basis of the PIRS model is the difference created by the player in the score which is added to the final score of the team. Since you have to play both with your superior opponents (negative difference) and downstream ones (positive difference), then a rating scale is created to display this difference. The rating stability allows you to simulate the upcoming match. The difference in the ratings in one action is converted into the difference of goals scored and conceded in a personal meeting and can be checked for compliance with the actual results obtained. The game consists of a sequence of diverse single combats (> 50 components) that end with a shot. Read more at www.ra-first.com. The balance of the won and lost single combats in each component in each pair of players is converted to the player's rating for this component. The fact of winning single combat isn't used in the calculation, but its cost does that means the expected change in the score in the case of winning single combat. The player's rating for the game component exponentially falls from the number of single combats in this component in the course of the game. This allows you to pre-allocate the number of single combats in each component so as to win their largest number. Due to the stability of the rating estimation player's ratings for all components can be obtained from the previous match. It is possible to calculate the most favorable arrangement for the team which the greatest number of single combats will be won in based on the distribution of the opponent's activity according to the positions of the players and the components of the game and placement during the match. From the DB the algorithm generates the most advanced combinations in the attack and the most dangerous attacks of the opponent in the defense. The result of the work is the expected maximum possible score of the game which must be on the scoreboard when the players fulfill all the conditions. Existing Instat, Basket-stats, ICEBERG, LONGO Match PRO, FUTSALSTAT, etc. form the headache of a trainer from the statistics of past games. PIRS technology provides already calculated solutions for the best result of the upcoming match. The trainer will not be able to compete with PIRS, since the information pool called handball is too large for one person. Therefore, the resource of the game in matches of different levels is used only by two thirds. Provided 50% of the recommendations are fulfilled, the team will receive 20 - 30% of the points collected additionally. An example of the work is shown at the match of Russia and Poland women teams on the World Cup on February 25, 2017.

Keywords: Handball, players, rating, single combats, tactics.

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INTRODUCTION

Is there a maximum result which one team can win another? The answer is objectively positive. You can have no idea where it is, but intuitively we understand that it exists. If it exists, how far is it from the usual level of the game? How close are modern trainers to it? We understand that their capabilities are very modest in this direction. Modern sport is attractive as long as it gives us surprises. If the result in basketball

was counted as well as the change in the score, then from this moment it would no longer exist as a phenomenon. If the more affluent clubs on the budget always win everyone, then no one would watch handball. Sport is beautiful in that it leaves room for a sporting feat. All the layouts change to this value. However, they also change for another reason. This is when the game of one team is maximally or minimally favorable for another. Therefore, to predict the score of

the match is so difficult. A person can live up to 120 years. There are examples of people who lived to 116-117 years. That is, the limit is achievable. We see this on individual examples. In Russia, however, men live up to 60-65 years. We are all used to the fact that 50% of the limit is the norm. On average, lifetime increases by 3 years every 10 years. We are slowly moving to the limit of our capabilities. And we'll be able to get it after 200 years. However, when the author shows the limit result to the team trainer, this usually causes distrust.

Problem

"The important elements that must be captured in any "systematization scheme" are: the game compartments: attack-defense (backboard following – basketball, or front shots following - ice hockey, etc.); type of action: individual, collective, team actions; groups of actions: without the ball, with the ball, between 2-3 players and the entire team; action variant and demanding regime: multiple solutions for the same game situation; variable solutions according to the opponent's behavior" [8].

Among the 90 Croatian championship matches, the authors [9] found 19 elements of collective tactics (duration, direction, etc.). The authors did not find any difference in the effectiveness of the attacks in the case of play on the typical for handball 6-0, 5-2 or 4-2 arrangements. It is also determined that attacks directed to the depth are much more effective than attacks directed at the width. The authors [10] displace to the neural network the need to make a study of the game structure in handball. This is sure to give the game optimization. The neural network they trained (DyCoN) gave recommendations which significance cannot be verified.

The authors [11] conducted a large-scale study at the world handball championships of 2005, 2007 and 2009. After analyzing 16,240 shots they came to the conclusion that the number of shots from 6 meters is reduced, but their effectiveness is increasing. The effectiveness of attacks from 9 meters remains steadily effective.

The authors [12] created a mixture of handball elements and a neural network in the hope that the model will be created by itself. The authors [13] pointed out the ability to smoothly switch from attacking actions to defensive ones in the arsenal of highly qualified teams at the Olympics.

The authors [14] analyzed the matches of the youth teams. They observed the frequency of heartbeats. They came to the conclusion about the need to vary tactics in the second half of the match to correspond the gaming load to the player capabilities.

The author [15] identifies a significant advantage of the first 8 national teams in rating by a

number of criteria: *the average number of attacks, the efficiency of attacks, the efficiency of goal throws, fast break goals per game, the efficiency of fast breaks, the efficiency of the goalkeeper, saves by the goalkeeper per game, number of turnovers per game, and the efficiency of position throws (wing, pivot, back court, break-through, fast break, and 7-meter).*

Due to the small scientific base in handball an analogy from basketball will be appropriate. There are a number of competing indicators of the player's utility in basketball and the corresponding correlation coefficient with the results of games: the coefficient of utility of the PBL (0.89), KPI (0.37), EuroKPI (0.37), KRP (0.9), NBA +/- (0.56), LithuaniaKPI (-0.17) [4]. Such low correlation coefficients explain to us why the expert coaching assessment still takes precedence over analysts' assessment.

It was already in 1997 when Polozov AA. published an article [2] which showed the fundamental possibility for the existence of a computer version of an upcoming match. Skorovich S.L., the current trainer of the Russian national futsal team, graduated from Institute of Physical Education, Sport and Youth Policy, URFU, in 2003. In that time we collaborated in the work on his diploma thesis. The Russian team has never won against the Spanish national team from 1998 to 2014. Our cooperation continued. The theme of the game modeling was in demand. Today, the national team of Russia has already won over the Spanish national team twice. And there is another leader in the world rating of teams in futsal. Later experience with the team was invested in other game sports.

Why is it difficult for a trainer to manage a game?

An information pool called handball is too large to be controlled by one trainer. If I ask you

"Who is the best and who is the worst player of your team?" - Then the answer is definite.

"Who are the 6th in the level of the game?" - Then the answer is most likely absent.

"Who is the fifth in coordination defeating?" - The answer is especially absent.

"Who is the fifth in the coordination defeating after 10 minutes of the game?" – You unlikely can answer. Etc.

We a priori ascribe to ourselves the ability to finely differentiate the ranking of players according to their game level, but in fact we cannot. Therefore, most of the game remains at the discretion of the players themselves. It's hard to believe that a trainer can, for example, say how a player's transfer from one position to another can change a match result, express in one number the tactical effect of the team in the last match. This is beyond the capabilities of the average person. In this situation, trainers-analysts, who usually use Instat, Basket-stats, etc., help to a trainer. These and other opponents calculate technical and tactical actions (TTA) that have no correlation with the results of games for

similar teams. Instat, Basket-stats are not able to answer specific questions. What is the score for this plan of a game? How much less dribbling will A player win from C one at the beginning of the game and at the end? How many goals will players score from this point of the field from an uncomfortable position? Our conversation with opponents always ends here.

The purpose of this study is to determine the maximum value of the match result in handball of the highest level on the basis of the created technology of result simulation. The latter is called Polozov Information Rating System, hereinafter referred to as PIRS.

Let's consider the indicators that filled the report on the work and preparation of the national women's national team of Russia in handball for the World Cup 2017 in Germany. Its author is Ziyar Marina Vladimirovna. From the report you can find out the age, height, weight, position on the field of each person in the team. A separate table is for the implementation of the scoring chances of each player from 6 meters, 7 meters, 9 meters, from the edge, with a counterattack, a quick breakthrough and the generalized value of the percentage of sales of the shots in just a match. A separate table noted that our team is younger than its main competitors by age and higher in terms of the growth of defense players.

Table 1: The effectiveness of the Russian team in the attack

Opponent	Total number of attacks	Effectiveness of attacks, %	Number of attacks completed by shot	Attacks without a shot	Goals	Effective attacks, %	Effectiveness of shots, %
Tunisia	55	90.9	50	5	36	65	72
Montenegro	53	84.9	45	8	28	62	62
Brazil	53	73.6	39	14	24	62	62
Japan	57	75.4	43	14	29	67	67
Denmark	59	89.8	53	6	27	46	51
Korea	64	81.3	52	12	36	56	69
Norway	61	90.2	55	6	34	56	37

A separate table shows the number of attacks that ended with a throw. It is obviously it correlates with the level of the opponent's game.

Table 2: The effectiveness of the game in defense

Opponent	Number of defenses	Effectiveness of defense, %	Defense with a shot	Defense without a shot	Conceded ball	Block
Tunisia	57	72	44	13	16	3
Montenegro	52	54	47	5	24	2
Brazil	53	70	39	14	16	
Japan	57	51	42	15	28	0
Denmark	59	54	53	6	27	9
Korea	65	46	56	9	35	4
Norway	61	44	38	23	34	3

Table 3: The Russian national team game against the rapid attack (counterattack) of opponents

Opponent	Number of counterattacks	Conceded ball	Number of fast attacks	Conceded ball	In total, with rapid attacks
Tunisia	2	2	2	2	4
Montenegro	2	1	4	3	4
Brazil	3	1	1	1	2
Japan	4	3	5	5	8
Denmark	6	5	3	3	8
Korea	5	4	5	5	9
Norway	12	9	4	3	12

In addition to the tables there are also generalized previous information for the tournament for the team and each player in total.

What can be extracted from this statistics? What significance could it have for future tournaments? How can you rate the player? We are dealing with the

approach that was practiced in the 70s. It is no exaggeration to say that this statistic is generally useless for analyzing the game.

Let's consider some problems of game analytics

1. The game consists of a single combat sequence allowing you to approach the ring and realize

the created moment. To determine the actual value of the cost we should understand how to evaluate the

implementation.

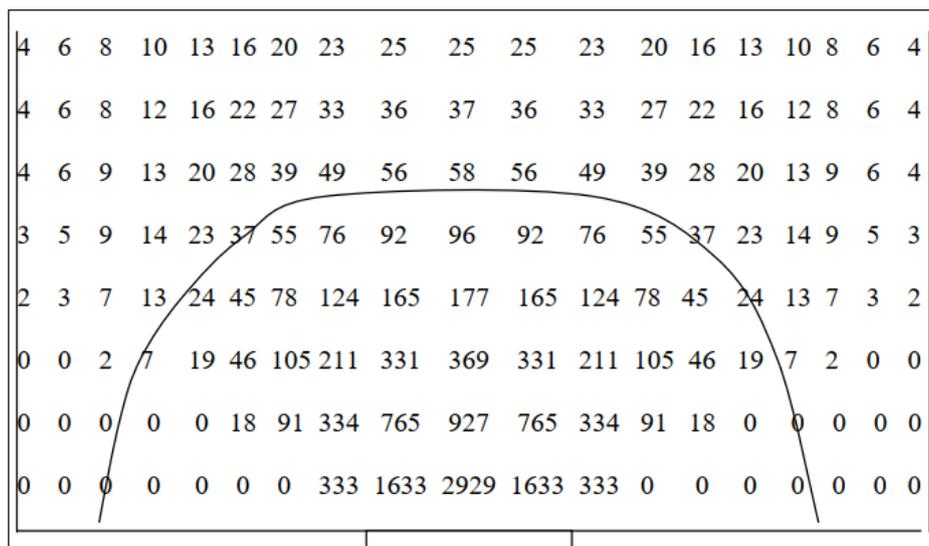


Fig 1: The distribution of the index on the handball field [1]

Let's imagine that we are at some point in the field and want to get into the gate. The index of the field point is ratio of the multiplication of α and β vertical angles of the view of the gate to the distance to the gate (r):

$$\varphi = \frac{\alpha * \beta}{r}$$

There is a link between the probability to score from the given point of the field in this match: $p = 1 - (exp(-\varphi\alpha/A))$, where $A = 23$ (for Russia). Any action on the field can now be estimated from the increase in this probability. Hereafter, this increase we call the single combat cost. On the other hand, we have to evaluate the player in the implementation of shots. The value of A is average for the players of this tournament (NBA, etc.). You can calculate the average probability of scoring for each shot of the player in the match. So by the end of the game we will get the expected number of points scored by the average rating and actually scored by the player. The difference between these two figures is the necessary evaluation.

We could use the same value of A for different types of shots, but this is an unreasonable decision. There is a paradox here. The player scores 3 points 40%. Then he gets on the penalty line and scores, for example, 77%. It would be logical to expect that from under the ring he will score at least 90%. But in fact this percentage can be twice lower. This is due to the non-standard implementation of shots (one hand, with a deviation, in a collision, etc.). Therefore, 4 types of shots are used - 3 points, 2 points (when throwing the ball are hold with both hands), foul shots and shots from the non-standard position.

2. Mixing of technical and tactical actions (TTA) and technical and tactical single combats (TTSC) should be considered as another problem of handball analysts. TTA can be set up even when the opponent on the field is not at all. As a rule, there is no dribbling at all in different classifications. Although there are a force, coordination and speedy dribbling. Rebound of the ball will be counted even if no one interfered with it. This creates data noise and low correlation. There is the term "active pass" that may not involve active opposition from the opponent. Active transfer is often non-registered if the ball is not scored. However, it is absurd to put one player into dependence on the realization of the moment of the other. Also, the foul handling is not always adequate to the game. Foul is a lost single combat. However, its estimation is often wanted to aggravate for the defender. This leads to inadequate operation of the model.

It is necessary to go from TTA estimates to TTSC. They are not less than 30. These are a pass for the back, dribbling (speed, coordination, and force), control of the ball in a situation when being knocked out, upper single combats, a pass tackling, barriers, etc. There is a forceful, coordinating and speedy dribbling. In addition to these well-known components, there are less actively used such as blocking a shot, restoring a position after a lost single combat, a barrier. TTSC are taken into account only as a loss of the ball and are recorded as an independent component.

3 The necessity to display the results obtained on an abstract rating scale

If an A player has beaten a B player for 5 out of 10 single combats in one of the components of the game in a match with one team, what will this ratio be in the match with a C player who plays in the next team

on the calendar? We cannot create a model without it. The key consideration is that the difference created by the team consists of the differences created by its players. Therefore, we need to arrange the teams on the scale of the rating at a distance corresponding to their score for a personal meeting. Then the players can be placed on it. A website www.ra-first.com was created, [12] where there was a section on handball. The current results of all club and national teams were obtained from the relevant sites and then transformed into a rating on-line. To prove the consistency of the concept the forecast for the next match was formed. The ratings of the teams set the average values of the ratings of its players.

4. Player's level is transferred into the rating and it is built for each component

The player's rating falls during the game from the number of single combats. But it happens with different speed. There are "light" single combats that are not associated with significant expenditure of energy. There are "heavy" ones. Finding the dynamics of decrease for each component of the game of each player is not a difficulty. The results obtained allow us to redistribute the match load among the players. The load is given to strong players until their level is equal to the level of the others. This mode is called equiparametric. This is the distribution of the number of single combats by players when the largest number of single combats in the match will be won. The player must be given such a distribution in comparison with his usual number of single combats.

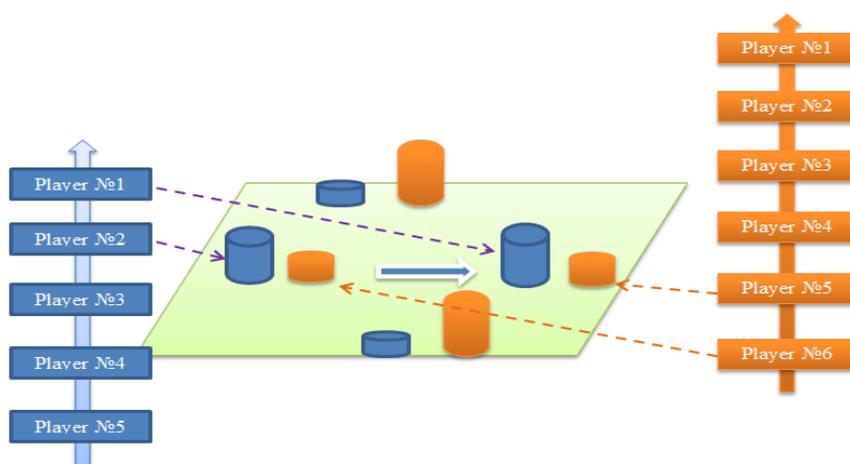


Fig 2: Game tactics and rating

5. Tactical Effect

It often happens that a player should collect a number of single combats in defense, but they are not enough on his position. The algorithm moves the player to another position where he will get the necessary number of single combats in this component. As a result, the algorithm rearranges the players throughout the game that gives significantly more won single combats. Accordingly, one must write to the player - when he goes, against whom he plays in the attack and defense. To do this you must use the substitution and placement of the opposing team in the previous match. Then, as a result, a table is formed for each minute of the match with the alignment of the opponent and our team in the attack and defense.

6. Team Combinations

There are about 400 combinations that assume more than 90% of the overall effectiveness of the game. The combination consists of a sequence of single combats and a shot. The probability to score a goal is equal to the multiplication of the probabilities of

winning their single combats, to score from a given point of the field. Probability is formed from a rating that decreases from the number of single combats. Hereafter, under advantageous replacement we mean player single combat with the greatest advantage in the corresponding rating (the greatest chances to win this single combat). The algorithm selects the most advantageous replacement and combines them in combination. The effect of combinations is that the strongest your players do not play with the weakest opponents. This gives an additional increase in the result [5].

Experimental Part

Recent game of the Russian national team can be used as an example. We watched the European Championship game between the women's teams of Russia and Poland on 25.02.2017. Video: Youtube «Russia - Poland. Handball. Women. 2015 World Cup "[6]. The score is 20:21. The value of the A coefficient is 71 that indicates the hegemony of the goalkeepers over the attackers.

Table 4: Women team rating of the European Championship-2016 and the expected score of the game with the Russian team (scored and conceded goals based on the rating) www.ra-first.com

Team	Rt	Z	P
Netherlands (W)	2498	26.98	25.02
Norway (W)	2485	26.67	25.33
Spain (W)	2468	26.21	25.79
Russia (W)	2460	26.00	26.00
France (W)	2451	25.76	26.24
Romania (W)	2425	25.11	26.89
Sweden (W)	2424	25.06	26.94
Czech Republic (W)	2423	25.04	26.96
Germany (W)	2420	24.97	27.03
Denmark (W)	2418	24.92	27.08
Montenegro (W)	2416	24.87	27.13
Hungary (W)	2401	24.48	27.52
Brazil (W)	2399	24.41	27.59
Slovakia (W)	2396	24.34	27.66
South Korea (W)	2377	23.85	28.15
Poland (W)	2358	23.37	28.63

The maximum possible score of the game is 32:16.

Table 4: The cost of won and lost single combat by the playmaker (1), light-middleweight (2), line player (3) and wing (4) in the match of Russia and Poland in 2016

The cost of 1 position	0.20	0.01
The cost of 2 position	0.21	0.08
The cost of 3 position	0.24	0.28
The cost of 4 position	0.26	0.38

Table 5: Won and lost single combat of match participants, created difference in single combat and the implementation of scoring moments

N	Name	Rt	N(+)	N(-)	Cost of won single combat	Cost of lost single combat	Difference		Shots for a goal		Difference	Rt in fact
									Goals	Sum vs Net		
3	Kavelinska M	2766	18	14	4.89	3.89	1.00	2284	6	2.40	3.60	3942
77	Kulvinsk	2606	10	4	3.63	1.24	2.40	2652	2	2.36	-0.36	1966
41	Stasik	2401	3	3	0.79	0.56	0.23	2398	1	0.47	0.53	2408
17	Bobrovnikova V	2376	7	3	1.73	0.73	1.01	2551	0	-1.05	1.05	1968
10	Hakobyan Olga	2348	11	11	2.77	2.64	0.13	2178	4	1.58	2.42	2931
19	Labuda Aneta	2318	2		0.29	0.00	0.29	2823	0	0.62	-0.62	2084
14	Kudlach K	2299	24	18	6.41	4.26	2.14	2303	5	4.68	0.32	2162
8	Sen' Anna	2293	2	3	0.75	0.61	0.14	2293	0	0.00	0.00	2144
2	Kuznetsova P	2231	7	5	1.35	1.30	0.05	2188	4	0.57	3.43	2430
13	Vachyereva A	2203	12	10	2.14	2.09	0.05	2203	6	0.02	5.98	2245
24	Bliznova I	2201	16	12	3.98	3.13	0.85	2319	1	-1.24	2.24	1524
19	Makeeva K	2195	18	19	5.46	5.25	0.21	2254	1	-1.08	2.08	1603
7	Dmitrieva D	2157	15	19	4.92	5.18	-0.27	2156	1	0.13	0.87	2211
4	Staszowska M	2149	13	15	3.35	3.52	-0.17	2149	0	0.00	0.00	2144
9	Kosela A	2076	5	3	0.51	0.43	0.09	2020	2	1.74	0.26	2276
5	Nidzhvedzh M	2044	14	19	3.66	4.62	-0.96	2045	1	1.28	-0.28	2005
25	Zalewska K	2034	7	7	1.08	1.63	-0.55	2044	2	2.37	-0.37	1960
22	Marennikova E	1901	3	6	0.50	1.26	-0.76	1941	1	-0.69	1.69	1798
89	Achruc	1885	13	17	2.44	4.66	-2.23	1879	2	2.23	-0.23	2067
33	Ilyina E	1851	6	7	0.99	1.83	-0.84	1828	2	-0.86	2.86	1925
25	Chernoivanenko O	1488	3	11	0.23	2.26	-2.04	1488	0	0.00	0.00	2144
70	Khmyrova	1293		3	0.00	0.78	-0.78	1160	0	-0.13	0.13	2091

Table 6: Recommended and actual number of single combats in the match of Russia and Poland in 2016

No	Full name	Recommended	In fact	Difference
19	Makeeva Ksenia	91	37	54
13	Vachyereva Anna	63	22	41
33	Ilyina Ekaterina	35	13	22
25	Chernoivanenko Olga	30	14	16
10	Akopyan Olga	30	22	8
7	Dmitrieva Darya	33	34	-1
8	Sen' Anna	3	5	-2
17	Bobrovnikov Vladlena	8	10	-2
70	Khmyrova	0	3	-3
24	Bliznova Irina	24	30	-6
22	Marennikova Ekaterina	0	9	-9
2	Kuznetsova Polina	0	12	-12

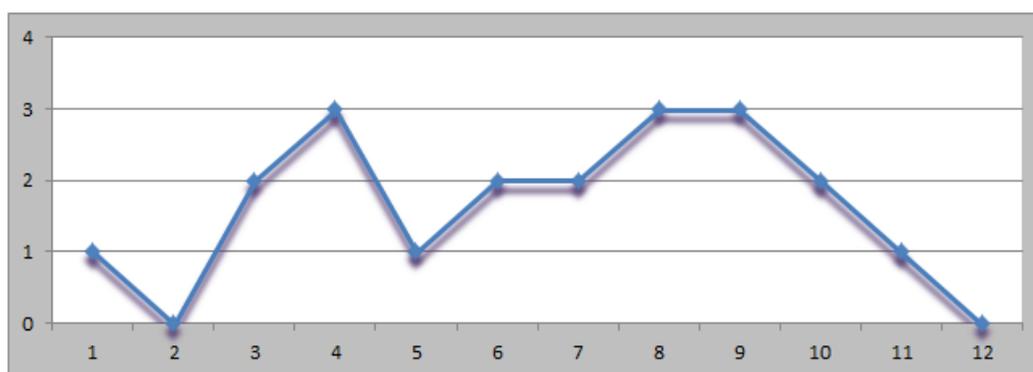


Fig 3: The number of goals scored by the Russian national team in the 5-minute segments of the match against Poland

As you can see in Figure 2, the overload of individual players of the national team leads to a

catastrophic drop in the effectiveness of the game during the match.

Table 7: The Polish national team line-up during the match and the best corresponding Russian national team line-up, the expected score of the match

минута	Польша оборона	Польша Атака	Мы забь	Нам забили	Россия атака	Россия оборона
1	5 14 4 5 9 25	89 3 14 77 25 9	0,5	0,4	24 33 7 10 17 13	13 8 17 19 7 25
2	5 14 89 4 9 25	5 3 14 77 25 9	0,9	0,8	24 33 7 10 17 13	13 8 19 17 7 25
3	5 14 89 4 9 25	89 3 14 77 25 9	1,4	1,2	24 33 7 10 17 13	13 8 19 17 7 25
4	5 14 89 4 9 25	89 3 14 77 25 9	1,9	1,6	24 33 7 10 17 13	19 8 25 17 7 13
5	5 14 89 4 9 25	89 3 14 77 25 9	2,3	2,0	24 33 7 10 17 13	19 8 25 17 7 13
6	5 14 89 4 9 25	89 3 14 77 25 9	2,8	2,4	24 33 7 10 17 13	19 8 25 17 7 13
7	5 14 89 4 9 25	89 3 14 77 25 9	3,3	2,7	24 33 7 10 17 13	25 8 19 17 7 13
8	5 14 89 4 9 25	89 3 14 77 25 9	3,8	3,1	24 33 7 10 17 13	25 8 19 17 7 13
9	5 14 89 4 9 25	89 3 14 77 25 9	4,3	3,5	24 33 7 10 17 13	25 8 19 17 7 13
10	5 14 89 4 9 25	89 3 14 77 25 9	4,8	3,8	24 33 7 10 17 13	25 8 19 17 7 13
11	5 14 89 4 9 25	89 3 14 77 25 9	5,2	4,2	24 33 7 10 17 13	25 8 19 17 7 13
12	5 14 89 4 9 25	5 3 14 77 25 9	5,7	4,5	24 33 7 10 17 13	25 8 19 17 7 13
13	5 14 89 4 9 25	5 3 14 77 25 9	6,2	4,8	24 33 7 10 17 13	25 8 19 17 7 13
14	5 14 89 4 9 25	89 3 14 77 25 9	6,7	5,2	24 33 7 10 17 13	25 8 19 17 7 13
15	5 14 89 4 9 25	89 3 14 77 25 9	7,2	5,5	24 33 7 10 17 13	25 8 19 17 7 13
16	5 14 89 4 9 25	89 5 14 77 25 9	7,7	5,7	24 7 17 33 2 13	25 8 19 17 7 13
17	5 14 89 4 9 25	89 3 14 77 25 9	8,2	6,0	24 33 7 10 17 13	25 8 19 17 7 13
18	5 14 89 4 9 25	89 3 14 77 25 19	8,7	6,4	24 33 7 10 17 13	25 8 19 17 7 13
19	5 14 89 4 9 25	89 3 41 77 25 19	9,2	6,6	24 33 7 10 17 13	25 8 19 17 7 13
20	5 14 3 4 9 25	89 3 41 77 25 19	9,6	6,8	10 24 7 33 17 13	19 8 17 25 24 13
21	5 41 3 4 19 25	89 3 41 77 25 19	10	6,9	7 24 17 33 2 13	25 17 19 8 24 13
22	5 41 3 4 19 25	89 3 41 77 25 19	10	7,1	7 24 17 33 2 13	25 17 19 8 24 13
23	5 41 3 4 19 25	89 3 14 77 25 19	11	7,3	7 24 10 33 17 13	25 17 19 8 24 13
24	5 41 3 4 19 25	89 3 14 77 25 19	11	7,5	7 24 10 33 17 13	25 17 19 8 24 13
25	5 41 3 4 19 25	5 3 14 77 25 19	12	7,7	24 17 7 33 2 13	25 17 19 8 7 13
26	5 41 3 4 19 25	89 3 14 77 25 19	12	7,9	7 24 10 33 17 13	25 17 19 8 24 13
27	5 41 3 4 9 25	5 3 14 77 25 19	13	8,0	24 17 7 33 2 13	19 7 17 8 25 13
28	5 14 3 4 9 25	5 3 14 77 25 19	13	8,1	24 7 17 33 2 13	19 8 17 25 7 13
29	5 14 89 4 9 25	5 3 14 77 25 19	14	8,3	24 7 17 33 2 13	25 8 19 17 7 13

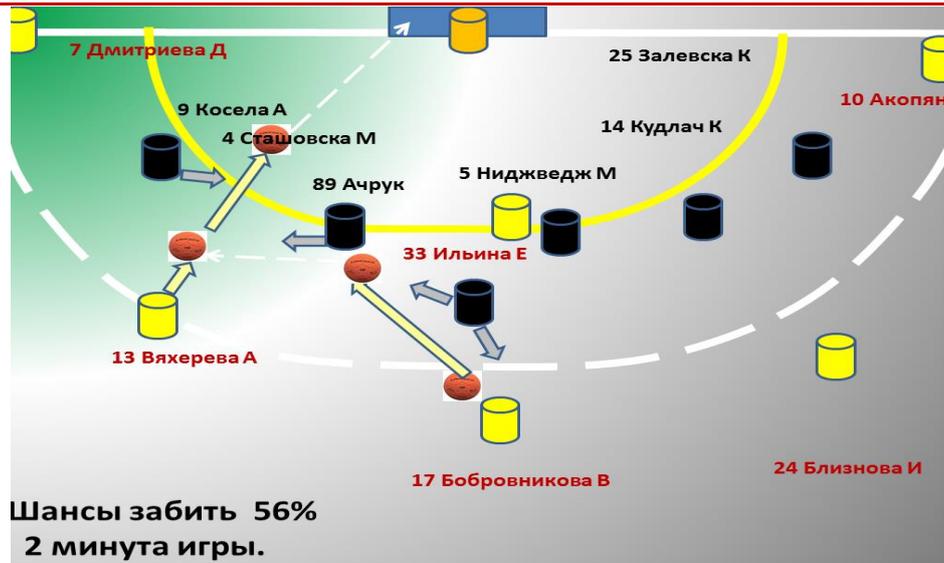


Fig 4: An example of a combination with a probability of 56% to shoot a goal with an average attack efficiency of the Russian team $20/80 = 25\%$

Table 8: The maximum result in matches of different levels

Year	Team	Team	Score	Prediction	Difference
2015	UMMC (Yekaterinburg)	PSK (Prague)	64:68	86:68	22
2016	Ural	Ryazan	65:66	78:36	43
2017	Olympiakos	Anadolu	87:78	109:42	76
2017	Russia	Serbia	78:87	163:100	72
2017	Uralmash	Ural	81:83	88:68	22
2017	Uralmash	Irkut	75:77	63:51	14
2017	Uralmash	Arsenal	64:86	110:73	59
2017	Uralmash	MSTU	120:70	173:75	48
2017	Tambov	Uralmash	59:50	77:162	96

As you can see from the presented table, the game resource is used only by two thirds in matches of the most different level. In the case of the women's national team of Russia in handball it was scored 20 goals out of 32 – the regularity is similar. This is about 20 to 30% of additional points when completing assignments by 50%.

Why is the maximum level practically unattainable?

- Players may not reproduce their level of play.
- Players may not remember too much information.
- Opponent can change his game.
- The dynamism of the game and the impossibility of its full determinism.
- Players are used to a certain model of their game in the team, etc.

To overcome all these difficulties it is necessary to create your game model for each next opponent and master it in training. Perhaps, after a while, handball players will also wear an earpiece on the game through which the coach will tell them what to do next like the stars of TV-series.

CONCLUSIONS

1. Computers are better playing chess and other games than a person. Game sports are next. An information pool called handball is too large to be effectively controlled by one coach. The resource of the game called handball is used only by two thirds by the forces of coaches. This unclaimed tactical resource of the game is the limit of the coach possibilities. Now there is the time of information algorithm competition. The competition of coaches turns into a competition of analytical groups.
2. The information rating technology (PIRS) proposed by the authors
 - Based on the priority for the game activity difference of goals scored and conceded goals
 - Represents a simple universal linear solution of a complex problem
 - Allows you to determine the maximum value of the game result with a given opponent based on his placement and distribution of single combats according to the positions of the players.
 - Forms answers in an understandable format of the advantages in the score

There are a number of other competing indicators of the player's utility in handball. But their correlation with the results of games is lower and they do not have such ability to create a computer version of the upcoming match as PIRS. Technology is better at the national team level where it is more difficult to work for a coach because of the large number of options to create a team.

3. The maximum result is practically unattainable due to the information complexity in the use of a large group of people. It is necessary to create your game model for each next opponent and master it in training, rather than using one universal version of the game.

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