Intelligent Information Technology for Organizing Swimming Competitions

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Abstract
To date, the judges of the competition independently dealt with organizational issues, such as: creating a single database of participants, ranking, protocol, formation of swims, sorting participants by different categories, calculating FINA points, checking for a new category and more. The presented intelligent information technology for the organization of swimming competitions simplifies the process of forming different types of competition protocols, which saves a lot of time and increases the productivity of judges and employees who organize swimming competitions. The rules for the formation of protocols, method and structural scheme of intelligent information technology for the organization of swimming competitions were first developed by the authors.

Keywords
Intelligent information technology, competition protocols, semanting parsing the natural language

1. Introduction

Today, it is advisable to delegate routine human work to the appropriate information systems, which greatly simplifies the process of performing the desired task and saves a lot of time.

Development and implementation of new competitive information technologies in various spheres of human activity in order to reduce the share of manual labor and minimize the impact of the human factor on decision-making is the main goal of the information society in Ukraine [1].

The field of physical education and sports is quite promising in terms of development and use of intelligent information technology. Information technology plays an important role in sports and games. This helps to avoid mistakes in the organization and administration of various sports and games at the global level. Information technologies in the field of sports are used for research activities in sports psychology, sports medicine, advanced training, coaching, kinesiology, biomechanics, etc [2].

The combination of new information technologies and the sports industry mainly means the deep integration of information technologies to make the organization of sports events more effective.

Faced with the huge potential for the development of the sports industry, the Internet giants have increased their investment in sports. In the context of new information technologies, new business models appear one after another on the way to the development of the sports industry, the combination of new information technologies and sports becomes a new trend in the future development of the sports industry [3].

The continuous development of information and computer technologies has led to their gradual application to sports training to achieve better practical results [4].

Throughout the existence of swimming pool sports complexes, the judges of the competition independently dealt with organizational issues, such as: creating a single base of participants, compiling ratings and protocols, forming swims, sorting participants by different categories, calculating FINA points, checking for a new category and more.

The development and implementation of the latest competitive information technologies in the field of swimming competitions will significantly save time and increase the productivity of judges and employees who organize competitions.

2. Literature review

Organizing sports meetings and presenting input and output information, statistics and queries was the most exhausting, complex and difficult work. Therefore, in the modern information age, a management system for sports gatherings based on information technology has been developed. It establishes registration management, game management in one, self-realization of sports management, intelligence, to improve the efficiency and quality of management. This paper considers the methods and processes that take place in the educational institution during the process of organizing sports games. The article presents the features of the developed management system of the respective higher education institution, which allows to increase the efficiency of sports management of colleges, as well as to promote sports development through effective exchange of information between participants, spectators and leaders [5].

The rapid technological development that is taking place today is affecting all aspects of human life. These rapid transformations lead to a number of changes in the structure and living conditions of society. Technology, which has begun to manifest itself in all its aspects, especially in this century, is important for people to achieve everything in technology and innovation as quickly as possible through the media. In this context, many countries are creating systems that produce sports technology by integrating technology into sport. These technologies, which are not limited to sports products, have also shown their impact on the materials used by referees who lead decision-making mechanisms in sports. The article is devoted to the assessment of the impact of sports, sports education, the use of technology and their impact on sports education. The work is descriptive and based on qualitative research methods. Document verification is implemented as a method of data collection [6].

Important requirements in the process of teaching students are the development of information technology and activation in physical education classes. This is especially true to provide students with personalized courses in physical education (physical education). Just as college physical education lacked specific application in the humanities teaching model, its game theory is also used in college physical education. It uses participants' behavior, information, strategies, etc. to develop teaching methods and learning materials using basic game theory concepts, and so on. This study proposes the Adaptive Data Reinforcement Technique (ADRT) technology, which is the right solution when its unique on-the-go reconstruction is combined with a Field Programmable Gate Arrays (FPGA) strategy. However, they do not usually develop in accessibility and ease of use. Then it becomes a process of introducing game theory and practice only into the physical learning process. Teachers should actively encourage students to participate in ball sports to actively improve student participation, which will improve competitive gaming skills, social interaction, strong work skills, and good communication. In games, the ability of management effectively improves the quality of human work, as well as fully plays an important role in physical education with game characteristics [7].

Surveys of sports fans suggest that they often use more than one information technology platform when watching sports. Three focus groups, a total of 20 participants, were used to learn how people use the Internet and information technology at the same time as they watch sports. Almost all participants noted that they regularly use information technology such as mobile phones and laptops to keep abreast of sports statistics. Twoscreen users also talked about the ability of technology to inform them about what is happening in the world of sports. Participants indicated that they are fans of several teams and therefore use technology to keep abreast of situations with other teams and

games while they watch one team on television. Easy access to mobile technology has made it possible to watch sports competitions on television and be aware of other sporting events at the same time [8].

Computer technology is widely used in the sports industry. They help athletes to train, analyze their physical condition, improve the honesty and transparency of sports competitions and results, promote the development of modern sports. The article analyzes how computers provide good technical support for the development of modern sports, achieve scientific and sound organization of various sporting events, strengthen the implementation of sporting events. This paper examines the use of computer technology in modern sports, discusses the impact of computer technology on the modern sports industry, the use of computer technology in sports training and the use of computer technology in broadcasting sports competitions [9].

Sports and pedagogical research provides statistical analysis of the results of observations. Stricter conditions are set for the training of future specialists in physical education and sports, in particular, the ability to respond quickly to challenges, systematically expand knowledge, perform complex calculations. To computerize the process of statistical calculations, it is proposed to consider multifunctional criteria, in particular Fisher's φ-test, because they can be used to solve various problems. The article substantiates the universality of the use of Fisher's φ-test in research in physical culture and sports. In sports and pedagogical research, scientists often have to deal with personal data presented on a nominative scale. In other cases, researchers have to correlate samples for particle size with certain characteristics. The process of analysis can be simplified for researchers in the field of physical culture and sports thanks to the software product MS Excel. The article contains examples of using the F-test to analyze sports and pedagogical data [10].

The use of computer technology and data intelligence technology in sports plays an important role in improving the training effect and competitive level of athletes. This article focuses on the development and implementation of a computer-aided big data analysis system for beach volleyball. Using a computer as a platform for data collection and analysis, it uses a sorting prediction algorithm and a Markov-based data analysis algorithm to predict the level of successful player interaction in a beach volleyball match and to find key transfer processes. The article developed and implemented a system of big data analysis for beach volleyball based on computer technology, and the results of experiments confirmed the effectiveness of the intelligence algorithm in beach volleyball matches. This study provides a scientific basis for coaches to form sound beach volleyball training programs and make tactical decisions that have some practical value [11].

Computer technology is widely used in the sports industry. It helps athletes to train, analyze their physical condition, improve the integrity of sports competitions, promote the development of modern sports. Therefore, it is very important to study the use of computer information technology in modern sports. The article analyzes that computers provide good technical support for the development of modern sports, achieve scientific and sound organization of various sporting events, strengthen the implementation of sporting events. This paper examines the use of computer technology in modern sports, discusses the impact of computer technology on the modern sports industry, the use of computer technology in sports training and the use of computer technology in broadcasting sports competitions [12].

The use of the potential of computer technology training in sports games and physical education, as a factor in the formation of a healthy way of training athletes, is an urgent problem of modern sports science. Modern information and communication technologies allow to organize independent educational activities using didactic methods. The paper [13] presents a study of the use of information technology in the field of physical culture and sports, especially in the field of sports games. The main purpose of the study is to analyze the possibilities of development and application of computer training technologies in sports games; to substantiate the effectiveness of the use of computer training systems in the formation of a healthy way of preparing athletes for sports games. Currently, in sports training there is a small sample of computer training programs aimed at technical and tactical training in various sports, but the factor of health orientation in them is not due, which led to further research. As part of the study, computer training programs were developed and experimentally implemented in the training process of athletes in sports games: "Video-information program for the preparation of team technical and tactical actions in basketball" and "Table Tennis Technique".

Thus, the literature review showed that despite the large number of attempts to develop and implement intelligent information technologies in sports, there are currently no intelligent information technologies in Ukraine that help judges organize swimming competitions to verify and record competition protocols. This article is devoted to solving this problem.

3. Analysis of the subject area of swimming competitions

In order to develop information technology for swimming competitions, it is first necessary to find out what tasks it should solve and what properties it should have. Subject area analysis should be conducted to identify these needs. During the analysis of the subject area of the developed information technology it is necessary to investigate the rules of the competition and the peculiarities of keeping the protocols of swimming competitions.

Swimming competitions differ in scale, purpose, form of organization, nature, composition of participants [14]. Competitions are held both at the level of individual teams and at the level of districts, cities, regions, and at the national level. There are also a number of international competitions, the Olympic Games (every four years), continental championships, world championships, as well as international matches.

Depending on the purpose, competitions can be divided into mass, training, demonstration and sports.

Mass competitions are designed to attract young people to regular swimming lessons.

Training competitions are held to check the quality of work for a certain period, as well as to select participants for the team, or for some other competitions. Training competitions are especially useful for novice swimmers in order to gain competitive experience.

Demonstration competitions are held for the purpose of agitation and propaganda. Their program includes victorious and spectacular types: short-distance swimming, various relay races, swimming in clothes, which are held during mass sports holidays. At sports competitions (championship of grassroots collectives, sports societies, areas, cities, countries, international meetings) there are stronger athletes in certain types of swimming and winning teams.

According to the form of organization, competitions are divided into closed, which can be attended only by representatives of organizations organizing these competitions, and open, when they are attended by all comers, regardless of whether they are members of the organization organizing the competition.

Competitions can be face-to-face and in-person, held both between individual participants and between teams and teams.

According to the principle of drawing - departmental and territorial. Regarding the nature of the competition can be: personal, individual team and team. In individual competitions, the results and places are credited to each individual participant. In individual and team competitions, the results are credited both to individual participants and to the team as a whole. In team competitions, the results of the participants are credited to the team as a whole and determine its place in the competition. According to the composition of the participants, they differ in gender, age and sports fitness.

Another important issue is determining the winners of the competition. Currently, in practice, there are two ways to determine the winners - direct and consistent selection of the strongest participants. The way to directly determine the winners is that the places of the participants are distributed according to the time shown in the swim. Swims in this way are made so that in each of them there were swimmers with approximately equal sports and technical results. Thus, the participant who showed the best result, regardless of the swim in which he participated, is the winner. The second method of determining the winners is usually used with a large number of participants and is that the winners are determined by two or three times, and sometimes four times (in the case of additional overflows) participation in this program number. There are three stages of selection of the strongest. The first step - previous swims. As a result of previous swims, which are drawn by lot, determines the number of swimmers who showed the best results, are allowed to further competitions, the rest are eliminated. The second step - semifinal swims. Competitors who showed the best time in previous swims compete, as a result, swimmers for the final swims are identified. The winner is the swimmer who showed the best time in the final swim. The following places are distributed among the

participants of the same final swim according to the results shown. Then the places are distributed among the participants who did not make it to the finals, according to their results. First, the results of the semifinals are taken into account, and then the previous swims.

Team scoring systems. To identify team results, the competition regulations set certain conditions. The first condition determines the quantitative composition of the team of swimmers. The team may or may not be limited in number. If the composition of the team is limited, it is indicated how many, as well as how many should be in the team of men and women, boys and girls, boys and girls, or their ratio is arbitrary. The second condition determines the number of swimmers from each team who are allowed to participate in each individual issue of the competition program. This number of athletes may also be limited or unlimited. The third condition determines the number of participants from each team. It can be conditioned (limited) or unlimited, ie the results of all swimmers who take part in the competition are included in the team competition. These conditions determine one or another way of assessing the team results of the competition. In the practice of swimming competitions, various credit systems are used, of which the most common are the systems of limited and Olympic protection.

The method of evaluating the results by the sum of places has certain shortcomings. Different results are evaluated by the same number of points.

According to the sum of points according to the special table, all the results of the participants are translated into points.

The places occupied by the teams are determined by the total amount of points scored by all participants, the number of which is set by the competition regulations. This method of evaluation better than others reflects the reality, as the number of points is strictly dependent on the results, where each fraction of a second is evaluated in all participants.

In the representations of intelligent information technology for the organizing of swimming competitions, the score system in the protocols is based on the standards of the FINA calculator [14].

The number of points is calculated according to the formula 1:

$$Points \ = \ 1000 * \left(\frac{Base}{Time}\right)^3, \qquad (1)$$

where Points - the number of points, Base - the base time in seconds, Time - the result of the swim in seconds.

This is a direct calculation. To calculate backwards, if it is necessary to calculate Time from a known number of Points, the above formula is used to calculate the first approximation. Thus formula 2:

$$Time = \frac{Base}{\sqrt[3]{\frac{Points}{1000}}}, \qquad (2)$$

Further, it is necessary to subtract 0.01 s from the obtained Time value. as long as the direct scoring of the time received is still equal to the initial score for which the time is being calculated.

4. Intelligent information technology for organizing swimming competitions

According to the International Olympic Committee (IOC) classification, swimming as a sport includes: sport swimming, water polo, diving and synchronized swimming.

It should be noted that we will consider intelligent information technology for the organization of swimming competitions.

Sport swimming - this swimming includes a variety of competitions held in pools with a length of 50 or 25 meters at a distance of 50 to 1500 meters, as well as in open water in the form of swimming long distances (5, 10, 25 km). The winner is the swimmer (team) who came to the finish line first.

The distance must be overcome by various strictly regulated rules of competition by means. Sports swimming methods include: freestyle (chest crawl), butterfly (dolphin), breaststroke, backstroke (crawl on the back). In terms of speed, the fastest way to swim is to crawl on your chest, then butterfly, crawl on your back and breaststroke.

Sports swimming methods (from left to right): crawl on the back, breaststroke, butterfly, freestyle.

Intelligent information technology for the organizing of swimming competitions should ensure the processing of submitted applications in natural language, the formation of start protocols based on

information from the submitted applications, the formation of final protocols, rating calculation. In addition, intelligent information technology for the organization of swimming competitions automates the semantic parsing (parsing) of competition protocols and forms the final protocols of competitions. The structure of intelligent information technology is shown in Figure 1.
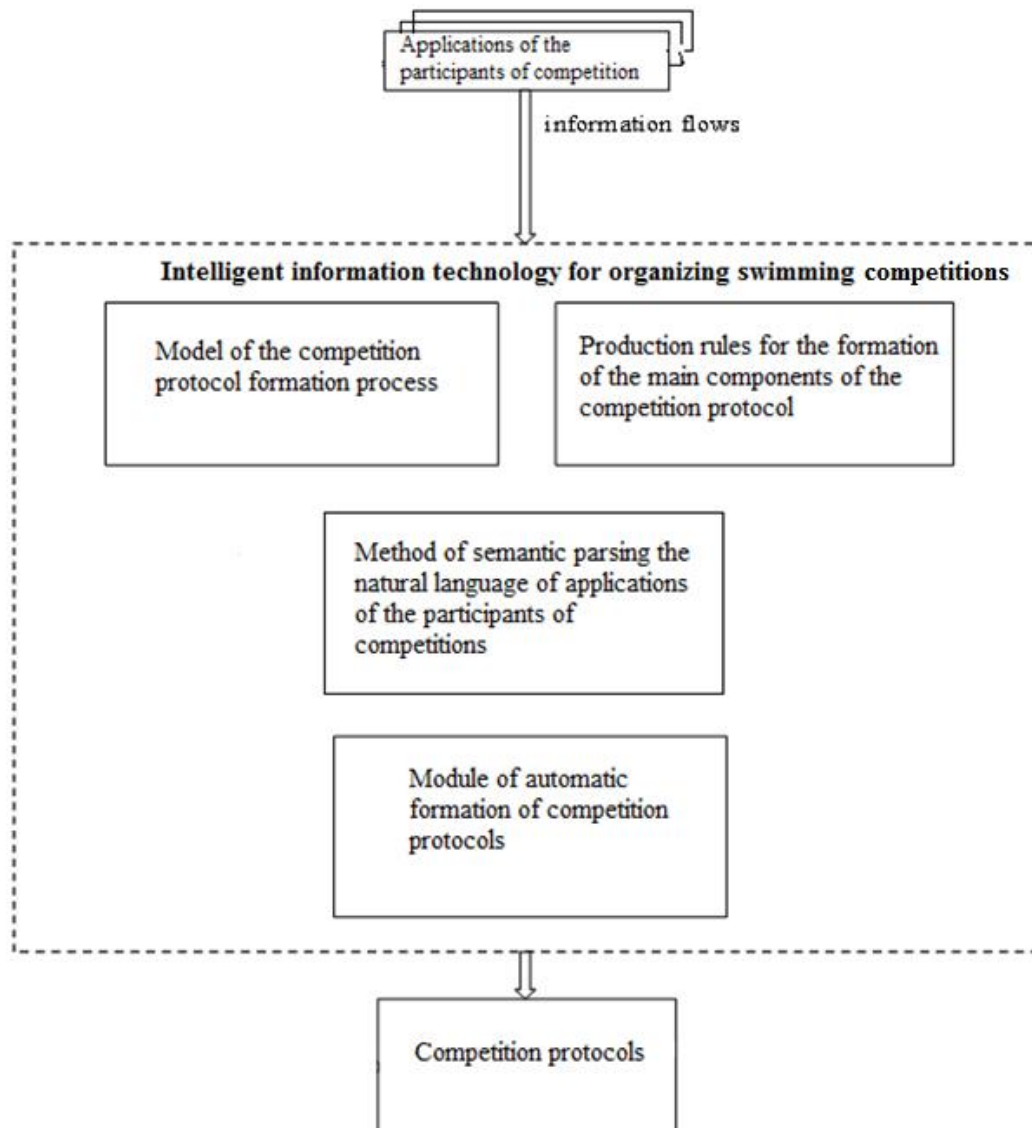

Figure 1: Structure of intelligent information technology for organizing swimming competitions

The process of forming the competition protocols with intelligent information technology for organizing swimming competitions is represented by the following sequence of steps:
1. We receive all submitted applications.
2. For formation of starting protocols of competitions we process applications on the following signs:
- type of program (categories and distances);
- article (women or men);
- team competitions or individual championship.
3. Creation of starting protocols of swims.
4. Formation of a rating by categories.
5. After the start swims we form the protocols of the final swims, which is formed from the list of winners of the start swims in accordance with the rules of the competition and the types of programs.
6. Finally, there is the formation of protocols of competition results.

First, we will develop rules for the formation of the main components of the protocols formed from the applications for the competition [14]. Note that the structure of the starting protocols, final protocols and sub-bag protocols is similar to the number of components in the protocols that are excluded. So, for the starting protocols of these components - 8. For the final protocols of such components - 9, and for the the resulting protocol protocols - 11. The main components of the protocols are:

1) Surname, name;
2) Gender;
3) Date of birth;
4) Age group (youth, juniors, youth, adults);
5) Sports category;
6) Type of program (individual, team);
7) Method of swimming;
8) Distance (50m, 100m, 200m, 400m, 800m, 1500m);
9) Results (time);
10) Received a sports category for compliance with the standard;
11) The number of points scored.

At the beginning of the formation of the rules counter $sp = 0$. The main components of the starting protocols are considered to be formed when the value of the counter $sp = 8$. There are also two sets W and M, which allow you to form competition protocols for women and men, respectively.

1. If the name and surname are indicated in the application, then $sp = sp + 1$;

2. If the gender is specified in the application, then $sp = sp + 1$;

3. If the specified gender is female, then form a protocol for women (set W) otherwise form a protocol for men (set M);

4. If the date of birth is specified in the application, then $sp = sp + 1$;

5. If the application specifies the date of birth, which corresponds to the age of 12 years and female gender, then $sp = sp + 1$ and form the element of the set W and the age group of young men;

6. If the application specifies the date of birth, which corresponds to the age of 13-14 years and female gender, then $sp = sp + 1$ and form a element of the set W and the age group of juniors;

7. If the application specifies the date of birth, which corresponds to the age of 16-17 years and female gender, then $sp = sp + 1$ and form the element of the set W and the age group of youth;

8. If the application specifies a date of birth that corresponds to the age of 18 and over and female gender, then $sp = sp + 1$ and form the element of the set W and the age group of adults;

9. If the application indicates the date of birth, which corresponds to the age of 14 years and male gender, then $sp = sp + 1$ and form the element of the set M and the age group of young men;

10. If the application specifies the date of birth, which corresponds to the age of 16-17 years and male gender, then $sp = sp + 1$ and form a element of the set M and the age group of juniors;

11. If the application specifies the date of birth, which corresponds to the age of 17-18 years and male gender, then $sp = sp + 1$ and form a element of the set M and the age group of young people;

12. If the application specifies a date of birth that corresponds to the age of 19 and over and male gender, then $sp = sp + 1$ and form the element of the set M and the age group of adults;

13. If the application specifies a sports category and female gender, then $sp = sp + 1$ and form an element of the set W, otherwise we form an element of the set M;

14. If the application specifies the type of program and gender, then $sp = sp + 1$ and form an element of the set W, otherwise we form an element of the set M;

15. If the application specifies the method of swimming and female gender, then $sp = sp + 1$ and form an element of the set W, otherwise we form an element of the set M;

16. If the application specifies the distance and gender of the female, then $sp = sp + 1$ and form an element of the set W, otherwise we form an element of the set M.

We formulate rules for the final protocols. At the beginning of the counter value $fp = 0$. The main components of the final protocols are considered to be formed when the counter value is $fp = 9$.

The first 16 rules for the formation of final protocols are formed similarly to the rules used for the formation of starting protocols.

1. If the name and surname are indicated in the starting protocol, then $fp = fp + 1$;

2. If the gender is specified in the starting protocol, then $fp = fp + 1$;

3. If the specified gender is female, then form a protocol for women (set W) otherwise form a protocol for men (set M);

4. If the date of birth is specified in the starting protocol, then fp = fp + 1;

5. If the starting protocol specifies the date of birth, which corresponds to the age of 12 years and female gender, then fp = fp + 1 and form the element of the set W and the age group of young men;

6. If the starting protocol specifies the date of birth, which corresponds to the age of 13-14 years and female gender, then fp = fp + 1 and form a element of the set W and the age group of juniors;

7. If the starting protocol specifies the date of birth, which corresponds to the age of 16-17 years and female gender, then fp = fp + 1 and form the element of the set W and the age group of youth;

8. If the starting protocol specifies a date of birth that corresponds to the age of 18 and over and female gender, then fp = fp + 1 and form the element of the set W and the age group of adults;

9. If the starting protocol indicates the date of birth, which corresponds to the age of 14 years and male gender, then fp = fp + 1 and form the element of the set M and the age group of young men;

10. If the starting protocol specifies the date of birth, which corresponds to the age of 16-17 years and male gender, then fp = fp + 1 and form a element of the set M and the age group of juniors;

11. If the starting protocol specifies the date of birth, which corresponds to the age of 17-18 years and male gender, then fp = fp + 1 and form a element of the set M and the age group of young people;

12. If the starting protocol specifies a date of birth that corresponds to the age of 19 and over and male gender, then fp = fp + 1 and form the element of the set M and the age group of adults;

13. If the starting protocol specifies a sports category and female gender, then fp = fp + 1 and form an element of the set W, otherwise we form an element of the set M;

14. If the starting protocol specifies the type of program and gender, then fp = fp + 1 and form an element of the set W, otherwise we form an element of the set M;

15. If the starting protocol specifies the method of swimming and female gender, then fp = fp + 1 and form an element of the set W, otherwise we form an element of the set M;

16. If the starting protocol specifies the distance and gender of the female, then fp = fp + 1 and form an element of the set W, otherwise we form an element of the set M.

17. If the starting protocol specifies the time, then fp = fp + 1.

We formulate rules for the resulting protocols. At the beginning of the counter value rp = 0. The main components of the final protocols are considered to be formed when the counter value is rp = 11.

The first 17 rules for the formation of final protocols are formed similarly to the rules used for the formation of the resulting protocols.

1. If the name and surname are indicated in the final protocol, then rp = rp + 1;

2. If the gender is specified in the final protocol, then rp = rp + 1;

3. If the specified gender is female, then form a protocol for women (set W) otherwise form a protocol for men (set M);

4. If the date of birth is specified in the final protocol, then rp = rp + 1;

5. If the final protocol specifies the date of birth, which corresponds to the age of 12 years and female gender, then rp = rp + 1 and form the element of the set W and the age group of young men;

6. If the final protocol specifies the date of birth, which corresponds to the age of 13-14 years and female gender, then rp = rp + 1 and form a element of the set W and the age group of juniors;

7. If the final protocol specifies the date of birth, which corresponds to the age of 16-17 years and female gender, then rp = rp + 1 and form the element of the set W and the age group of youth;

8. If the final protocol specifies a date of birth that corresponds to the age of 18 and over and female gender, then rp = rp + 1 and form the element of the set W and the age group of adults;

9. If the final protocol indicates the date of birth, which corresponds to the age of 14 years and male gender, then rp = rp + 1 and form the element of the set M and the age group of young men;

10. If the final protocol specifies the date of birth, which corresponds to the age of 16-17 years and male gender, then rp = rp + 1 and form a element of the set M and the age group of juniors;

11. If the final protocol specifies the date of birth, which corresponds to the age of 17-18 years and male gender, then rp = rp + 1 and form a element of the set M and the age group of young people;

12. If the final protocol specifies a date of birth that corresponds to the age of 19 and over and male gender, then rp = rp + 1 and form the element of the set M and the age group of adults;

13. If the final protocol specifies a sports category and female gender, then rp = rp + 1 and form an element of the set W, otherwise we form an element of the set M;

14. If the final protocol specifies the type of program and gender, then rp = rp + 1 and form an element of the set W, otherwise we form an element of the set M;

15. If the final protocol specifies the method of swimming and female gender, then rp = rp + 1 and form an element of the set W, otherwise we form an element of the set M;

16. If the final protocol specifies the distance and gender of the female, then rp = rp + 1 and form an element of the set W, otherwise we form an element of the set M.

17. If the final protocol specifies the time, then rp = rp + 1.

18. If in the final protocol the sports category for performance of the standard is received, then rp = rp + 1;

19. If the number of points scored in the final protocol, then rp = rp + 1.

Method of semantic parsing the natural language of applications of the participants of competitions, as well as the formation of final and resulting protocols of competitions consists of the following steps:

1. semanting parsing the natural language of applications of the participants of competitions, as well as the formation of final and final protocols of competitions - using the above groups of production rules, according to which the counting of counters sp, fp and rp;

2. if sp = 8, then we can conclude that all the main components of the start protocol are available and it is possible to form a starting protocol;

3. if fp = 9, then we can conclude that all the main components of the final protocol are available and it is possible to form a final protocol;

4. if rp = 11, then we can conclude that all the main components of the resulting protocol are available and it is possible to form the resulting protocol.

5. Results & Discussion

Consider the functioning of the developed intelligent information technology for the organization of swimming competitions.

A prototype of information technology was created, with the help of which 15 protocols of swimming competitions at the level of the Ukrainian championship were developed. Below, Figures 2 - 4 show the results of processing the protocols of swimming competitions of the Ukrainian championship.

Figure 2: Dialog box showing the results of processing the starting protocols of the competition

Figure 3: Dialog box showing the results of the FINA calculator for counting points and forming the component of the resulting competition protocol

Figure 4: Dialog box showing the results of processing the resulting protocols of the competition

	IMS	MS	CMS	I	II	III	I
50m (freestyle)		00:23.50	00:24.50	00:26.00	00:29.50	00:33.50	00:38.
100m, (freestyle)		00:52.00	00:55.50	00:59.50	01:07.00	01:15.00	01:24.
200m, (freestyle)		01:55.00	02:02.00	02:12.00	02:27.00	02:46.00	03:07.
400m, (freestyle)		04:04.00	04:18.00	04:38.00	05:08.00	05:50.00	06:30.
800m, (freestyle)		08:30.00	09:00.00	09:40.00	10:40.00	12:30.00	-
1500m, (freestyle)		16:16.00	17:10.00	18:30.00	20:33.00	23:16.00	-
50m, (backstroke)			00:28.00	00:30.00	00:33.50	00:38.00	00:43.
100m, (backstroke)		00:57.00	01:00.00	01:05.00	01:12.50	01:22.00	01:32.
200m, (backstroke)		02:05.50	02:12.00	02:22.00	02:39.00	03:00.00	03:23.
50m, (breaststroke)			00:31.00	00:33.50	00:37.50	00:42.50	00:48.
100m, (breaststroke)		01:04.50	01:08.50	01:14.00	01:22.50	01:33.50	01:45.
200m, (breaststroke)		02:20.00	02:29.00	02:40.00	02:59.00	03:23.00	03:48.
50m, (butterfly stroke)			00:27.00	00:29.00	00:32.50	00:37.00	00:42.
100m, (butterfly stroke)		00:56.00	00:59.50	01:04.00	01:12.00	01:21.00	01:33.
200m, (butterfly stroke)		02:05.00	02:12.00	02:22.00	02:39.00	03:00.00	03:23.
100m (medley swimming)			01:02.00	01:07.00	01:15.00	01:25.00	01:35.
200m (medley swimming)		02:09.00	02:16.00	02:27.00	02:45.00	03:05.00	03:28.
400m (medley swimming)		04:34.00	04:50.00	05:13.00	05:49.00	06:36.00	-

Therefore, the results of the experiment allow us to conclude that the presented intelligent information technology for the organization of swimming competitions simplifies the process of forming different types of competition protocols, which saves a lot of time and increases the productivity of judges and employees who organize swimming competitions.

The rules for the formation of protocols, method and structural scheme of intelligent information technology for the organization of swimming competitions were first developed by the authors.

Further research will be devoted to the possibility of adapting the developed information technology for the organization and conduct of competitions in other sports.

6. References

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