noted above, from few in number experiments. Confirmation of the latter thesis can serve as a basis for the continued work and study.

4. NOTATIONS

$a = \lambda/(c \cdot \rho)$ - temperature conductivity coefficient; $\mathrm{Bi} = (\alpha \cdot \delta)/\lambda$ -Biot similarity criterion; C - Euler constant; c - the heated body's material heat capacity; $\mathrm{Ei}(z)$ - integral exponential function; $\mathrm{Fo} = (a \cdot \tau)/\delta$ - Fourier similarity number; l - the typical size of the body; R - radius of the cylinder and sphere; S_x - area of the layer parallel to the surface of the body at a distance x from the origin of coordinates; t_0 - ambient and body temperature before heating ($_0$- zero); $t_{срд}$ - ambient temperature after the heating starts ($_{срд}$ - environment); t_n - surface temperature of the body during heating ($_n$ - surface); $t_ц$ - temperature in the center of the body during heating ($_ц$ - center); t_x - temperature at an arbitrary point of the body in the direction of x co-ordinate; $\widetilde{t}$ - Mean integral body temperature during heating; V_T - volume of the heated body; α - heat transfer coefficient from the surrounding media to the body; δ - ½ of the plate's thickness; λ - thermal conductivity of the body material; ρ - density; ϑ - current temperature deviation at the selected point from the temperature before heating; τ - heating process time.

References

[1] Brunetkin, M.V. Maksimov, "Determining the natural frequency of fluid via the integral coefficients method," *Journal of V. N. Karazin Kharkiv National University*. # 977. The series "*Mathematical Model. Information Technology. Automated control systems*". Issue 17. 2011, pp. 60-66;

[2] A.V. Lykov, *Thermal conductivity theory*, Moscow: Higher School, 1967.

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THE AUTOMATION SYSTEM OF ACCOUNTING SPORTING ACTIVITIES

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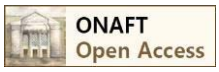

Анотація: Останнім часом стає популярним здоровий спосіб життя. Спорт є діяльність, яка служить інтересам суспільства, реалізуючи виховну, підготовчу і комунікативну функції, але не є постійною спеціальністю (професією) людини. Розвиток актуальних видів спорту, вимагає ресурсів, які будуть не тільки автоматизувати роботу організаторів змагань з інформацією, а й підвищать її ефективність. Одним з прогресуючих видів спорту на даний момент є пауерліфтинг (силове триборство). Пропонується інформаційна система автоматизованого робочого місця організатора змагань. В ході реалізації інформаційної системи супроводу спортивних змагання було виконано проектування системи за допомогою UML діаграм. Це дозволило зрозуміти завдання, які необхідно виконати при реалізації програми. Програму організована таким чином, щоб можна було швидко і просто внести всі дані про майбутні змагання: назва, місце проведення, дати, склад рефері. Після отримання інформації про спортсменів, тренерів, спортклубах, внести заявку на участь в змаганні. Також організатор має можливість переглядати статистичні дані про тренерів, рефері, учасників на основі введеної раніше інформації в базу

даних.Розроблена детальна інструкція користувача програмою. Проведено функціональне тестування і зручності використання. Запропоновано рекомендації для подальшого розвитку програмного продукту.

Annotation: In recent years become a popular healthy lifestyle. Sport is an activity that serves the public interest by implementing educational, preparatory and communicative function, but not a constant specialty (profession) person. The development of current sports, requires resources that will not only automate the work of the organizers of the competition with the information, but also improve its effectiveness. One of the progressive sports at the moment is powerlifting (power triathlon). The proposed information system is an automated workplace of the organizer. During the implementation of the information system support sports competitions were performed system design using UML diagrams. It is possible to understand the tasks that must be done in the implementation of the program. The program is organized so that you can quickly and simply add all data about upcoming competitions: the name, location, date, the composition of the referee. After receiving information about the athletes, coaches, sports clubs, to make an application for participation in the competition. Also, the organizer has the ability to view statistics about the coaches, referees, participants, based on the information entered into the database earlier. A detailed user guide program. A functional testing and usability. Recommendations for further development of the software product.

Ключові слова: пауерліфтинг, інформаційна система, спортивні змагання.
Key words: powerlifting, information system, sports competitions.

Introduction

A physical culture and sport are the important factors of harmonious development of personality and achievement of physical and spiritual perfection of man, by basis of becoming of healthy way of life, patriotic feelings for citizens and positive international image, by priority directions of humanitarian politics of the state, what is marked by Law of Ukraine "On a physical culture and sport" [1].

Today, the development of this sport like powerlifting (power triathlon), requires resources, that not only would automatize work of organizers of competitions with information about sportsmen, trainers, referees, sport clubs, motion of competitions, other participants, by statistical data and results, but also promoted her efficiency, productivity and comfort [2-4]. In the last few years quite a bit systems of automation of different processes are worked out in industry and economy [5]. Coming from the above-mentioned, very actual is a task of creation of the computer system from the account of sport work in powerlifting.

Main body

The main functions of the software system is:

-collection, editing, storage of information about sportsmen, trainers, referees, sport clubs, places of realization, motion of competitions;

-calculation of the specialized statistical data on the base of the got information.

By data, that on the exit of the program, is: scales of barbell, estimation of judges for different attempts, diagrams of statistics of referee and trainers on status, participants on divisions and versions. Also it is automatically necessary to expect a result in the sum of competitions in corresponding classes.

The stage design system contains the following UML diagrams.

-diagram of component, that represents what actions executed into the program, by means of components;

-diagram of precedents, that represents that there are users and what functions they can execute;

-diagram of sequences, that represents exchange (this is the method invocation.) messages between a few objects in the separate situation limited to time [6].

By means of mockups service the comfortable for understanding interface of the system (on Fig.1 a main form that contains the constituents of main menu is represented) is worked out. On a main form nine buttons by means of that it is possible to carry out passing to the necessary forms with information.

It allows to capture tasks that must be executed during realization of the program, namely: automation of work with information, revision of statistics and calculation of results.

A diagram of components is a static structural diagram, shows partitioning software system for structural components and relationships (dependencies) between them.. The diagram of components represents dependences between the components of software, including initial code, binary components, and such that can be executed, describes the features of physical view and allows to define architecture of the system, setting dependences between the programmatic modules [7].

The basic elements of this diagram are components, interfaces and means of implementation. This diagram (fig. 2) represents cooperation between the layers of the informative system. The informative system includes for itself the next layers of diagram of components, the elements of which include the main form content:

- top (custom) contains all the necessary user, menus and other controls;
- for work with data of the system, that keeps all information high-usage from a database and gets to the user in the epiphase of software product;
- for work from DB - connection, and storage of all data.

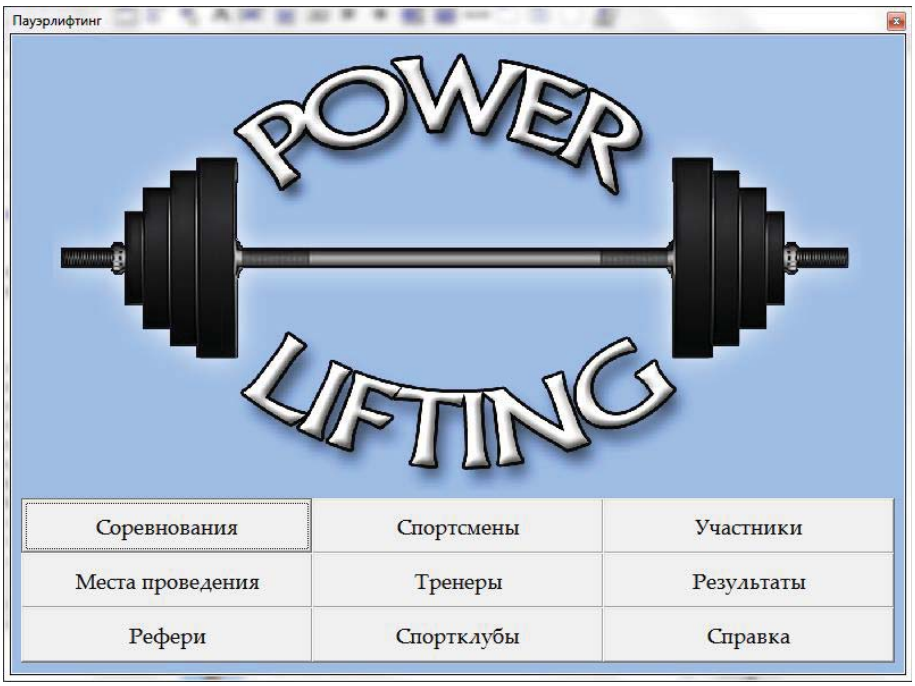

Fig. 1 – The main form of the program

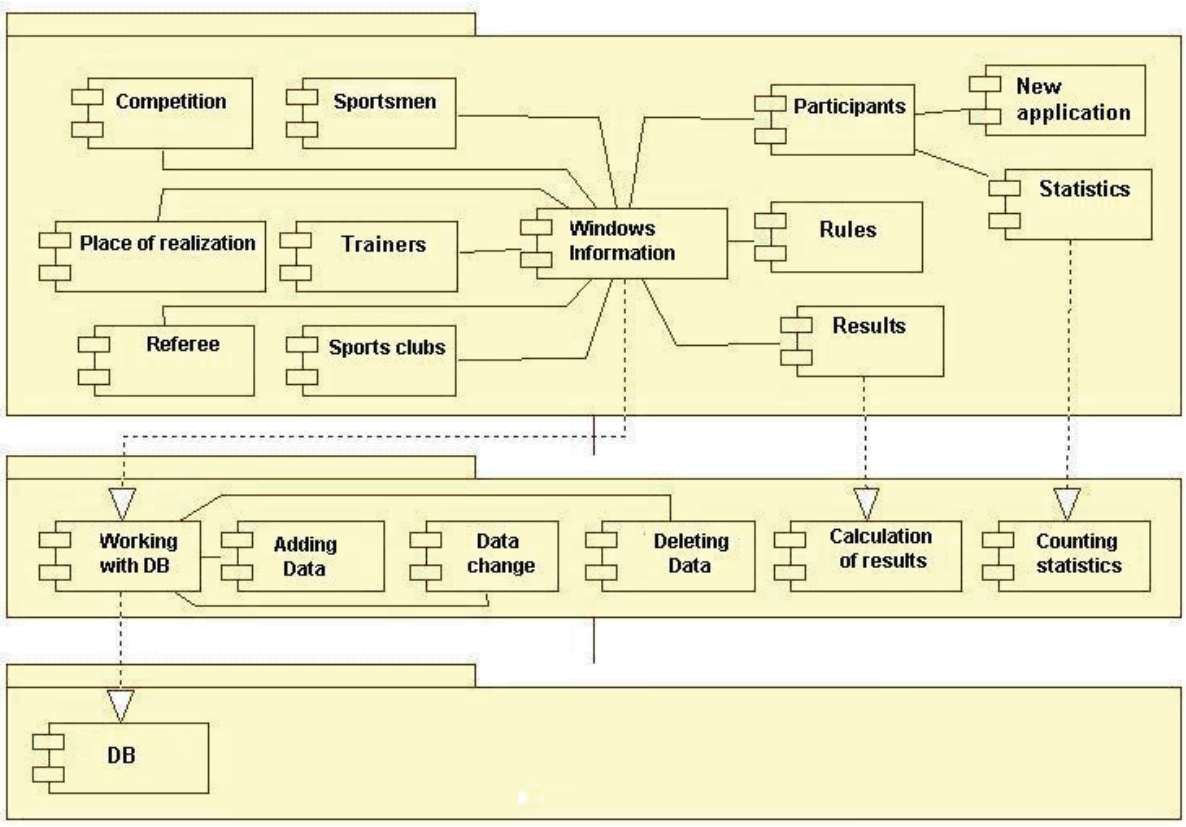

Fig. 2 – Diagram of components

Working with information about the competition is available in the form of "competitions".. Overhead part of form is intended for adding of new competitions to the calendar: introduction of the name, choice of place of realization, introduction of date of beginning and completion, choice of referee. To change and delete information maybe in a table.

Information about a referee and trainers is accessible on the corresponding forms of "Referee" and "Trainers". Overhead part of forms contains a table, that is intended for addition, change and moving away of information about a referee and trainers. An underbody contains statistical information and diagrams.

On the form of " Statistics", shown correlations of amount of participants in amateur and professional versions, in divisions with equipment. and division without equipment.

The serve of requests from sportsmen on participating in competitions takes place on a form the "New application" (Fig.2). For filing of an application it is necessary to push the button of "New application" and to choose: sportsman, name of competitions, gravimetric and age-old categories, version and division.

At pressure on the button pass "Results" to the corresponding form. It choose one of the competitions and get information about weight rods each athlete in 3 sets of 3 exercises and evaluating them. The final result is the sum of maximum weight rod approaches with a positive assessment for each exercise.

All background information on the general rules of the competition, equipment, practices and standards available in the form of "Rules".

The program envisages one type of user is an organizer. Possibilities of user are the valuable use of the program. The diagram of precedents, that represents program functionality, is below given (Fig.3).

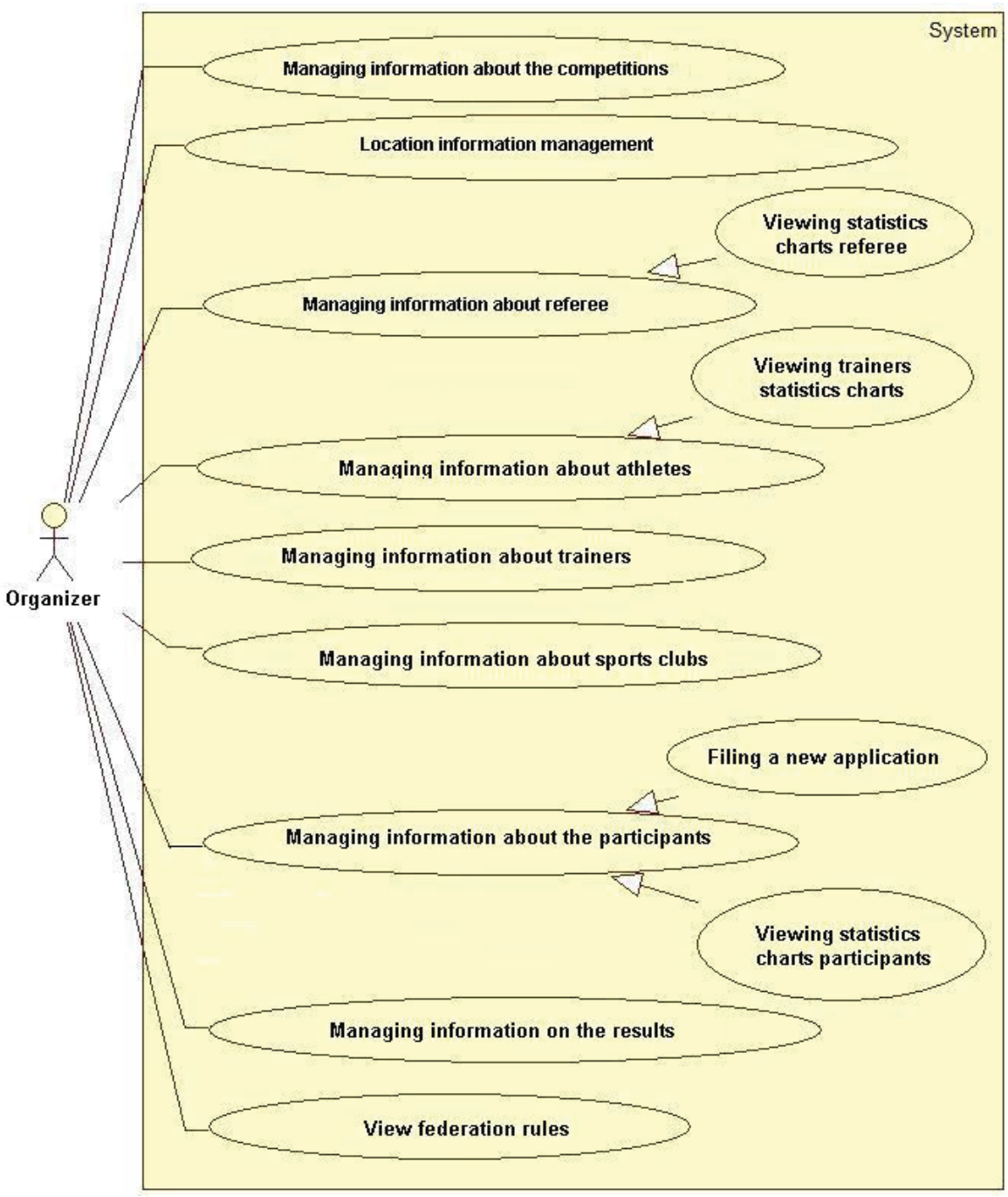

Fig. 3 – Diagram of precedents

A basic scenario presents by a soba general sequence of executions of user during work with the informative system (Fig.4). Statistics settles accounts and represented, using the information given from a database.

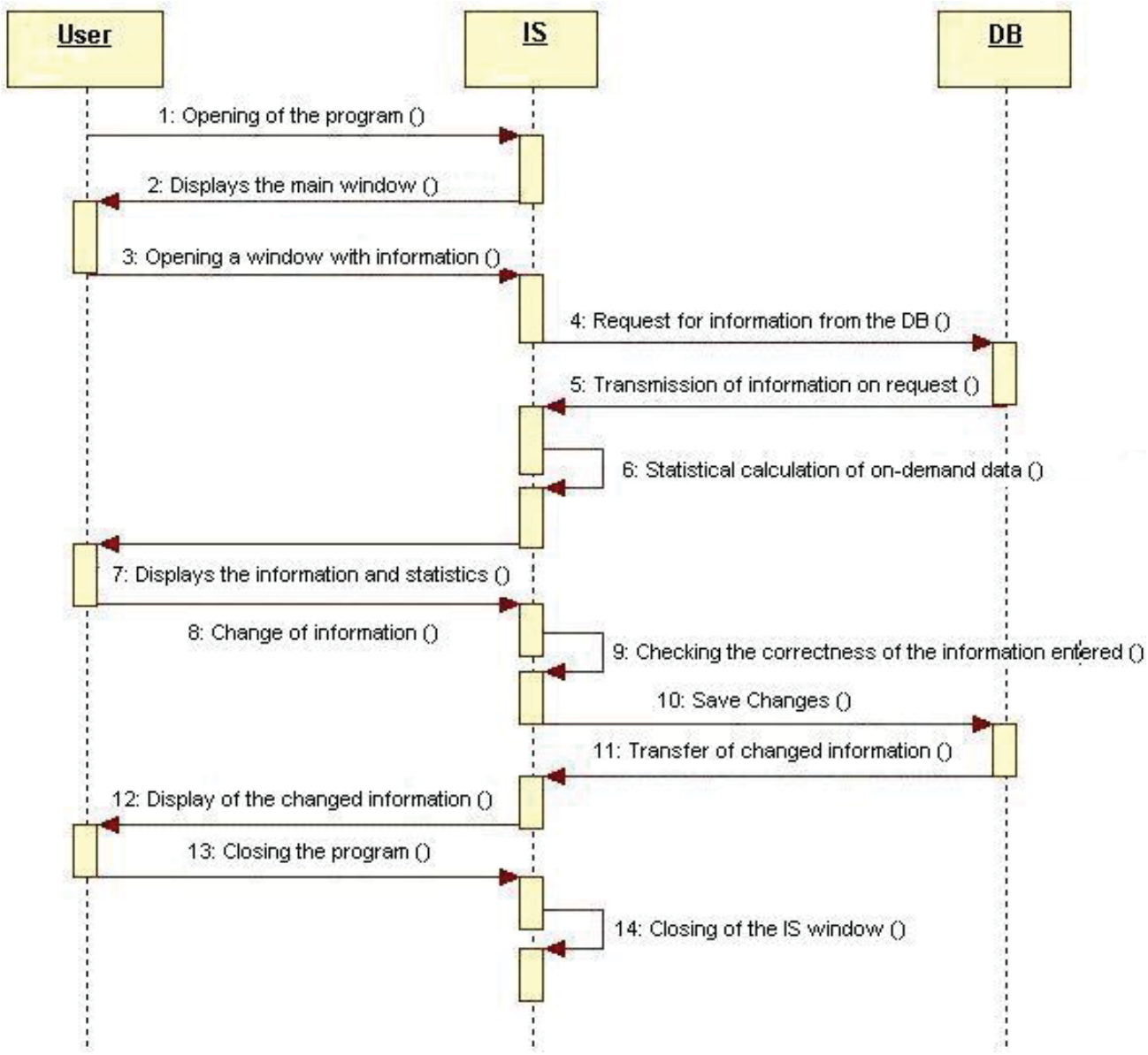

Fig. 4 – **Diagram of sequences of basic scenario**

One of the charts calculate statistics referees, trainers and participants on the status of divisional and versions offered below (Fig. 5).

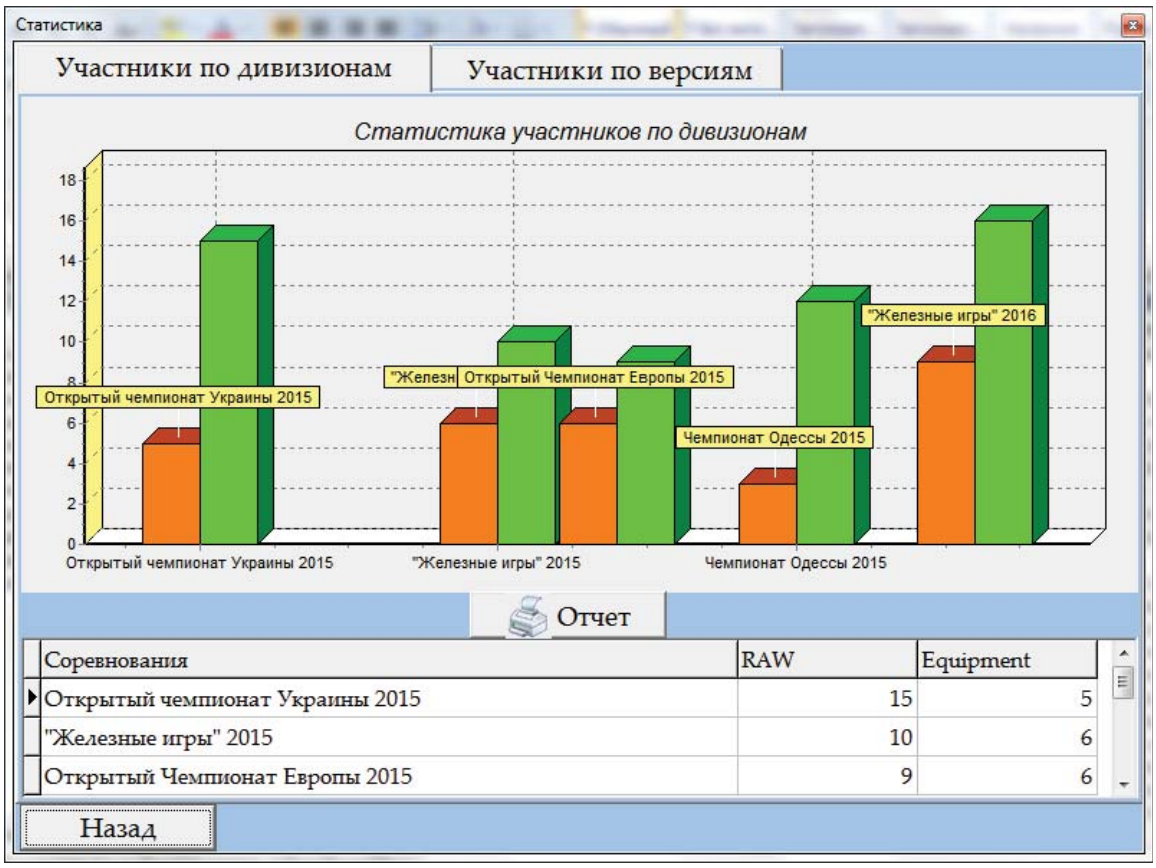

Fig. 5 – Statistics of participants of competitions is after divisions, versions (amateurs/are professionals)

A software product is realized by means of environment of Delphi 7.0, that has in the order wide possibilities on creation of additions of databases given [8]. For development of database one of most popular control system by the bases of data of Microsoft Access is used [9].

Conclusions

During realization of the informative system of accompaniment of sport competitions planning of the system was executed by means of UML of diagrams. It allowed to understand tasks that must be executed during realization of the program. The detailed instruction of user is worked out. Made functional testing and usability testing.

During realization the calculation of birth-certificates of programmatic code that will allow to perfect development in further and also compare to other, near on functionality programs was also conducted.

A software product can be also improved by addition of new functions, improvement of man-machine, expansion of possibilities interface. Improved organization of sports competitions in powerlifting lead to an increase in popularity of the modern sport.

References

[1] Zakon Ukrayini «Pro fIzichnu kulturu i sport». vid 24.12.1993 № 3808-XII, redaktsiya vId 05.12.2012, pIdstava 5460-17.

[2] M. Roztorguy et al, "Diyalnist providnih sportivnih organizatsiy yak chinnik rozvitku pauerlIftingu," *Sportivna nauka Ukrayini*, no. 2(46), pp. 3-6, 2012;

[3] Vsesvitnja federacija pauerliftingu v Ukraïni: [Elektronnij resurs]. Rezhim dostupu: http://wpa-ukraine.com

[4] Sajt ukraïns'koï federaciï natural'nogo pauerliftingu: [Elektronnij resurs]. Rezhim dostupu: http://wnpf.com.ua.

[5] O.A. Shpinkovskij and M.I. Shpinkovska (17-26, December 2013). "*Sistema prognozuvannja virobnichoï dijalnosti ta rozvitku fermerskogo gospodarstva"*. Perspektivnye innovacii v nauke, obrazovanii, proizvodstve i transporte. [Online]. Available: http://sworld.com.ua/index.php/ru/technical-sciences-413/informatics-computer-science-and-automation-413/20865-413-1172. [Accessed: January 7 2014];

[6] D. Grinfild, *Fabriki razrabotki programm (Software Factories): potokovaja sborka tipovyh prilozhenij, modelirovanie, struktury*, Kiev: Dialektika, 2006;

[7] G. Buch et al, *Jazyk UML. Rukovodstvo pol'zovatelja*, M.: DMK, 2000;

[8] M. Flenov, *Programmirovanie na Delphi*, SPb.: BHV, 2005;

[9] T.S. Karpova, *Bazy dannyh: modeli, razrabotka, realizacija*, SPb.: Piter, 2001.