References

1. Марри Р. Биохимия человека. Том 1 / Р. Марри, Д. Греннер, Д. П. Мейес, В. Родуэлл // Москва: «Мир», 1993. С. 55.

Marry R. Biokhimiya cheloveka. Tom 1 [Human biochemistry] / R. Marry, D. Grenner, P. Meies, V. Roduell // Moscow, "Mir", 1993. S. 55. [in Russian].

2. Заводник И. Б., Лапшина Е. А. Процессы окисления гемоглобина человека / И. Б. Заводник, Е. А. Лапшина // Биохимия. 1996. Т 61 (1). С. 42–48.

Zavodnik I. B. Protsessy okisleniya gemoglobina cheloveka [Processes of oxidation of human hemoglobin] / I. B. Zavodnik, E. A. Lapshina // Biochemistry. 1996. Vol 61, №1. S. 42–48 [in Russian].

3. Космачевская О. В. Альтернативные и дополнительные функции эритроцитарного гемоглобина / О.В. Космачевская, А.Ф. Топунов // Биохимия. 2019. Т. 84 (1). С. 3–23.

Kosmachevskaia O. V. Alternativnye i dopolnitelnye funktsii eritrotsitarnogo gemoglobina [Alternative and additional functions of erythrocyte hemoglobin] / O.V. Kosmachevskaya, A.F. Topunov // Biohimiya. 2019. T. 84 (1). S. 3–23. [in Russian].

4. Dotsenko O.I. Potential role of cytoplasmic protein binding to erythrocyte membrane in counteracting oxidative and metabolic stress / O. I. Dotsenko, I. V. Mykutska, G. V Taradina, Z. O. Boiarska // Regul. Mech. Biosyst., 2020. Vol. 11, №3. 455-462.

Anastasiia Neskorodieva
Illia Stavytskyi
Vasyl' Stus Donetsk National University
Vinnytsia
Research Supervisor: O.S. Vietrov, Senior Lecturer
Language Advisor: O.O. Dakaliuk, Senior Lecturer

DEVELOPMENT OF THE PROGRAM "DEPARTMENT"

Introduction. The process of solving any complex problem can be divided into three interrelated global stages, which are shown in figure 1 [1].

First, as we see, we must build a model of our system, or in other words, formalize the problem.

Once the model is built, the stage of developing the solution algorithm begins, and then we have the stage of writing the program. The algorithm allows you to implement the model on a computer, and the program in the modern sense is interpreted, of course, much wider than just the program implementation of the described algorithm. It is a complex software package consisting of many related components (such as a software kernel, database, graphical interface, etc.), and is

developed according to the accepted standards, especially when it comes to a commercial product.
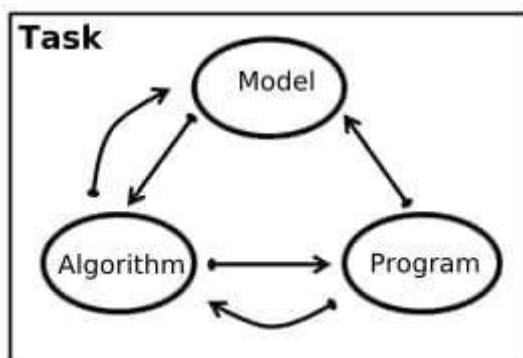

Fig.1 Interrelated global stages

These stages are interconnected (which is clearly shown in Picture 1): in the process of direct development of a computer program, there is often a need to correct the algorithm, mostly in two directions: either increasing its effectiveness due to the more detailed analysis of input data (from an abstract general algorithm to a particular problem), or simply correction of the algorithm, if the testing has detected logical errors, "bottlenecks", characteristic examples of disruption of the correct operation of the program (counterexample), etc.

Review of recent publications. In the publication by Yu.V. Beregovikh, B.A. Vasiliev, N.A. Volodin, solution of the problem with the possibility of applying the genetic algorithm is examined [2]. The authors S. V. Bevz, Ph.D., Assoc. Prof.; V.V. Voitko, Ph.D., Assoc. Prof.; S. M. Burbelo; A. M. Shobotenko consider the method of solving the problem using web technologies, in particular CCS and HTML [3]. This article is dedicated to the algorithm for the formation of class schedules using subjective preferences.

Objectives of the paper. The described scheme will be fully used by the authors for the development of the information system "Department", containing useful tools for administering the work of the department according to the norms and regulations adopted at Vasyl' Stus Donetsk National University.

The information system, which is planned to be developed in the future, should comply with the national standards [5]. The software package created for the implementation of the above-mentioned system, will meet all the accepted industry standards and norms of the national education system of Ukraine.

Results of the research. It should be noted that software systems with the similar functional exist and have some demand. In particular, a commercial software application "BIT.VUZ. Accounting of teachers' workload" from 1C company is worth our attention [5]. The main functions of this IT solution are the following:
- import of curriculum,
- planning of workload of the departments in automatic and manual modes,
- distribution of the planned load of the department for each teacher,

- flexible adjustment of load calculation parameters according to the requirements of the higher education institution,
- automatic calculation of the planned auditory load of the department,
- automatic accounting of the actual workload on departments and teachers according to the schedule of classes,
- automated accounting of the actual workload on departments and teachers,
- use of arbitrary formulas for calculating the load and comparing the planned load of each teacher with the actual performance.

The application has two subsystems: department load planning and teacher load planning. The functions of the latter one are the following: maintaining the personnel history of teachers both manually in terms of positions, rates and types of cooperation, and automatically using the integration with the personnel base, the distribution of the planned workload of the department among teachers, the formation of reports on the planned workload of teachers, the formation of an actual workload of teachers in automatic mode according to the schedule of classes taking into account replacement registers and in automated mode, the formation of reports on the actual workload of teachers, with the possibility of comparison of planned and actual implementation.

There are Ukrainian analogues, such as a software package "Dean's Office", an automated management system for higher education institutions, which is designed to organize and support the educational process in higher education institutions of Ukraine of I-IV accreditation levels [7]. It should be noted that the mentioned program is paid, and it is an information system at the faculty level with a large number of opportunities and functions that are not typical for the work of the department.

Despite the existing analogues, the development of own software application is an urgent task. The created product will have an open license, and can be brought to the desired result by each specific user, based on specific needs.

The system developed by the authors will have a similar functionality with the existing solution [6] but optimized for the national legislation of Ukraine and will take into account the peculiarities of electronic document flow adopted at the Faculty of Information and Applied Technologies and Vasyl' Stus Donetsk National University as a whole. A large number of useful services both for the Head and employees of the Department, which theoretically cannot be in third-party solutions, since they take into account the concrete business needs of the Department specific to the given structural unit, are planned to be added to the system.

Conclusion. The main feature of the planned program implementation will be that the designated software product is under development, at the stage of the model in the simplest form from a technological point of view. It is essential as the realities of education are such that operators who work with the system at the department level do not always have the technical skills needed for the effective work with a complex distributed system. Thus, the efficiency of the overall work will fall. Simplicity is also important in terms of the rate and cheapness of development, as well as flexibility of operation.

The peculiarity of the system implementation is the idea of processing incoming documents in the form of spreadsheets, which fully corresponds to the specifics of electronic document flow at Vasyl' Stus Donetsk National University.

The software part of the system will be implemented using the Python 3.x programming language.

References

1. Лемешевский С., Громыко Г., Чуйко М. Математическое моделирование: модель-алгоритм-программа / Наука и инновации. 2017. № 7 (173). С. 16-21.

Lemeshevski S., Gromyko H., Chuiko M. Matematicheskoye modelirovaniye: model – algoritm – programma [Mathematic modeling: model – algorithm – programme] / Nauka i innovatsii. 2017. № 7 (173). S. 16-21 [in Russian].

2. Береговых Ю.В., Васильев Б.А., Володин Н.А. Алгоритм составления расписания занятий / «Искусственный интеллект», 2009. №2. С. 50-56.

Beregovykh Yu.V., Vasiliev B.A., Volodin N.A. Algoritm sostavleniya raspisaniya zanyatiy [Algorithm for scheduling classes] / "Artificial Intelligence", 2009. №2. S. 50-56 [in Russian].

3. Бевз С. В., Войтко В. В., Бурбело С. М., Шоботенко А. М. Розробка автоматизованої системи формування розкладу магістратури / Інформаційні технології та комп'ютерна техніка, наукові праці ВНТУ, 2009. №4.

Bevz S.V., Voytko V.V., Burbelo S.M., Shobotenko A.M. Rozrobka avtomatyzovanoi systemy formuvannia rozkladu mahistratury [Development of an automated system and the formation of the Magistracy schedule] / Informatsiini tekhnolohii ta kompiuterna tekhnika, naukovi pratsi VNTU, 2009. №4 [in Ukrainian].

4. Мулява І. Я. Система формування розкладу навчального занять з використанням суб'єктивних переваг / Міжнародній журнал Комп'ютерні науки, 2016. №7. С. 22-27.

Muliava I. Ya. Systema formuvannia rozkladu navchalnoho zaniat z vykorystanniam subiektyvnykh perevah. [The system of class schedule formation with the use of subjective preferences] / Mizhnarodnii zhurnal Kompiuterni nauky, 2016. №7. S. 22-27 [in Ukrainian].

5. ДСТУ ISO 5127:2018 (ISO 5127:2017, IDT)

DSTU ISO 5127:2018 (ISO 5127:2017, IDT). [in Ukrainian].

6. Облік навантаження викладачів [Електронний ресурс]. Режим доступу: https://www.1cbit.ru/1csoft/bit-uchyet-nagruzki-prepodavateley/

Oblik navantazhennia vykladachiv [Accounting of lecturers' workload]. Retrieved from: https://www.1cbit.ru/1csoft/bit-uchyet-nagruzki-prepodavateley/ [in Ukrainian].

7. Пакет программ «Деканат» [Електронний ресурс]. Режим доступу: http://www.politek-soft.kiev.ua/ru/index.php?do=products&product=deanery

Paket prohramm "Dekanat" [Software Package "Dean's Office"]. Retrieved from: http://www.politek-soft.kiev.ua/ru/index.php?do=products&product=deanery [in Ukrainian].

Mariia Nadolna, Anastasiia Rudenko
Vasyl' Stus Donetsk National University
Vinnytsia
Research Supervisor: I.Y. Zhdanova, PhD in Criminal Law, Assoc. Prof.
Language Advisor: O.O. Odintsova, Senior Lecturer

INTERPOL ACTIVITIES TO COORDINATE COOPERATION TO FIGHT CYBER CRIME

Introduction. In today's world, information technology has spread to all areas of society, providing access to a large amount of information that becomes a weapon in the hands of criminals. Therefore, high-tech crime occupies a special place among socially dangerous acts and is one of the threats to the global security of mankind.

Thus, Yu. Maksymenko notes that the formation of the information society has both undoubted positive and certain negative consequences. On the one hand, the transfer of large amounts of information has accelerated, its processing and implementation have accelerated. On the other hand, the spread of illegal collection and use of information, unauthorized access to information resources, illegal copying of information in electronic systems, theft of information from libraries, archives, banks and databases, violation of information processing technologies, launch of viruses, destruction are serious concerns and modification of data in information systems, interception of information in technical channels of its source, manipulation of public and individual consciousness, etc. The transformation of society into information has changed the status of information. Today, it can be both a means of security and a threat and danger [1].

In developed countries, the economic losses from the progression of cybercrime are measured in very significant amounts. For example, according to Interpol, the losses of European economies from cybercriminals amount to 750 billion euros annually. According to LACNIC, which analyzes Internet activity, US cybercrime losses range from $20 billion to $140 billion, or about 1% of the country's GDP, and in Latin America, cybercrime losses are $1.1 billion [2].

According to Interpol, the rate of increase in crime on the global computer network is the highest compared to other types of crime, including drug and arms trafficking [3].

Therefore, the urgency of this problem is due to the fact that high-tech crime requires a concerted international effort to combat it. Thus, the importance of Interpol's activity as a universal international organization that coordinates the cooperation of states on this issue is growing.