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**DEVELOPMENT AND BUILDING EXPERT SYSTEM FOR CHOICE OF
TYPE SERVICE IT-INFRASTRUCTURE**

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Virtually every enterprise, regardless of the scope of activities and organizational-economic characteristics, has a specific IT infrastructure. Its operation plays an important role in the organization, so you must keep it in order and to troubleshoot the problem in time. In addition, having learned to save money on the crisis in the IT, business today does not seek to increase their expenditure on computerization dramatically. On the contrary, more and more attention is paid to optimize the capabilities of the IT infrastructure. The task is complicated - you need time to provide the development and stay within the budget. Thus, it is important to choose the right kind of service company to support IT infrastructure.

Subject area for this expert system is to serve the IT infrastructure. Often the head of the organization faces a difficult task of choosing this type of service on its own, without the help of experts, etc. Alongside it is necessary to take into account many different criteria and parameters of the company. In order to simplify this task an expert system which allows you to take into account all necessary factors and opportunities of the enterprise, was developed reducing the time spent by the head and reducing the risks when making decisions.

Expert systems are the bright and rapidly progressive direction in the field of

artificial intelligence. The reason for the increased interest is the possibility of their application to solving problems from various areas of human activity.

It is the quality of the expert system which is determined by the size and quality of the knowledge base (rules or heuristics). The system operates in the following cyclic mode: select (query) data or test results, observation, interpretation of results, the assimilation of new information, the creating with the rules of temporary hypotheses and then choosing the next piece of data or test results. This process continues as long as the sufficient information to enable a final conclusion is received.

At any given time there are three types of knowledge in the system:

1. Structured knowledge - knowledge about the static field. Once these skills are identified, they are not changeable.

2. Dynamic knowledge - variable knowledge about the subject. They are updated while the new information as to identified.

3. Working knowledge - skills used to solve a specific problem or for consultation.

Thus, the main challenge in developing an expert system was the choice of subject area.

Subject area at a time can be represented as a set of entities, concepts and situations. The selected set of entities, concepts and situations is called of the subject area its state. Since the concepts differ with each other with the help of the signs state the of the subject area can be set if the values of all attributes of the concepts used to describe subject area are known. The concept is a generalization of a class of objects according to their specific characteristics.

To understand the chosen subject area one should be aware of the value of the following concepts:

1. IT infrastructure through the concept of infrastructure
2. Software – licensed free
3. Local Area Network hardware as a software complex
4. Information resources through the property of information "importance"

5. IT outsourcing through the concept of outsourcing

6. IT Manager - full-time employee, a representative of an IT company, freelancer

The next step was to determine the relationships between concepts and the selection of the conceptual component of the field of knowledge. The formation of the conceptual component of the field of knowledge is based on the identification of the conceptual structure of the subject area, since this structure contains concepts and models the basic functional relationships (or relationships between concepts). These relationships reflect the model or strategy for making decisions in the selected subject area.

The functional component of the field of knowledge was further highlighted. Determination of decision strategies, ie, the identification of chains of reasoning, connects all the previously formed concepts and relationships in a dynamic system of the field of knowledge. That strategy gives the activity to the knowledge, they sort out the model of the subject area and conduct a search from the conditions to the target. Conceptual and functional components complement and refine each other.

Further, the expert system using shell EsWin was developed. Tool software ESWin is used to create and exploit the advising expert systems for solving various problems, leading to the decision-making tasks (diagnosis, configuration, identification, etc.). The software is designed on the base of the technology of hybrid expert systems represents the knowledge in the form of frames, rules, products and linguistic variables, which allows to develop and launch special programs in the form of exe-files, but also in the process of solving problems it allows to use the data from the database access which is carried out using SQL-queries generated automatically.

The selected software supports the solution of problems by the method of reverse fuzzy inference. In this case the facts are taken from the dialogue with the user and stored in the database of facts. Subject area and dialogue with the user are described in the form of frames. The dialogue can be used to explain the graphics format GIF, BMP, JPEG, HTML, PNG, as well as text files in TXT. Progress in the solution is explained by the trace, reflecting the sequence of rules-products and

derived facts.

The results of the test system show that the proposed expert system has been successfully operating in the area of decision-making concerning the choice of a particular type of service company for IT infrastructure.

The system can not only help in choosing the type of service, but also to pinpoint the bottlenecks of his enterprise to the head.

The main advantages of this expert system are the opportunities to accumulate knowledge and to adjust it to a specific company with the minimum time spent. In this regard, as a further development of the expert system it is supposed to broaden the base of knowledge, clarifying certain rules, as well as to improve the inference mechanism in order to improve ergonomics expert system.

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**THE PARALLEL ALGORITHMS BASED ON THE CUDA
TECHNOLOGY FOR SOLVING ADAPTIVE OPTICS PROBLEMS**

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In this paper we consider the possibility of using NVIDIA CUDA technology for the construction of parallel algorithms for solving problems of adaptive optics.

Keywords: parallel computing, computing on graphics processors, the technology NVIDIA CUDA, adaptive optics.

Currently, all the more urgent becomes parallel computing. Many scientific problems and problems of mathematical modeling for calculating a reasonable time require more computing resources than able to provide a central processor (CPU) of PC sequential calculations. When parallelizing calculations for modern CPU, with up to six cores in Intel Core i7-980X, calculation speed increases proportionally to the number of nuclei. If you do not optimize the program further, the rate of increase in the number of times, how many kernels parallelized computation.