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ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ ДЛЯ ПОДДЕРЖКИ ПРИНЯТИЯ РЕШЕНИЙ

***Аннотация:** в статье рассмотрены характеристики и цели информационных технологий поддержки принятия решений, обеспечивающих полное взаимодействие человека и компьютера. Авторами определены основные типы таких технологий, а также их применение в различных отраслях.*

***Ключевые слова:** система обеспечения принятия решения, система данных, оптимизация, анализ данных, применение в отраслях.*

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INFORMATION TECHNOLOGIES FOR DECISION SUPPORT

Abstract: *this article discusses the characteristics and purpose of information technologies for decision support that ensure close interaction between a person and a computer. The main types of these technologies are defined, as well as their application in various industries.*

Keywords: *decision support system, data system, optimization, data analysis, application industries.*

Introduction.

In the twenty-first century, there is an increasing need for qualitative analysis of problems and development of their solutions. This complex process allows you to optimize information technologies for decision support. Thanks to this ability, these technologies have become widespread in all spheres of life, from banking to the educational industry. Information technologies for decision support provide close interaction between a person and a computer, thereby allowing you to develop the most effective solution to a specific problem. This type of technology was developed in the late 70's-early 80's, mainly with the support of American scientists, but it has become widespread around the world.

Description and purpose of information technology decision support.

At the moment, various types of technologies are used to analyze problems and develop their solutions, which create conditions for human interaction with the information environment. It is information technologies for decision support that are the most effective means for performing many types of tasks. When using them, a person acts as a leading link, which indicates the initial values and considers the final result. The program, on the other hand, is a computational link over which control is performed.

A unique feature of decision support technologies is a completely new way of building human-system interaction. Its special features include:

- Focus on tasks with weak structure;

- The end of the process of analysis, verification occurs at the decision of the person;
- Combining canonical methods of access and information processing with the capabilities of mathematical models and methods for solving problems on their basis;
- Targeting a user who does not have perfect computer skills;
- Fast adaptation to the features of the existing maintenance and software, as well as user requests.

The problem is solved due to the results received in the process of data processing. This is the main condition for the work of ITDS. The main components of this system are: a database, a model database and a software management system. (Figure 1)

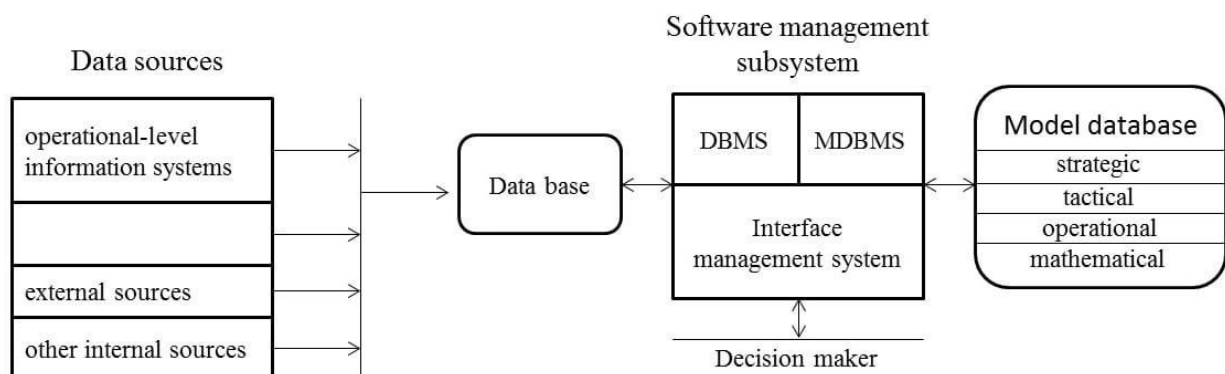


Figure 1. The main components of information technologies for decision support

The database is an important element of the system, since data from it can be used for calculations when solving a specific problem. There are several sources of information that are included in the database. These include:

- Operational-level information systems;
- Internal data;
- External data.

Model database – a place to store models that are necessary for describing and optimizing objects and processes. The model is based on a mathematical vision of the problem. Using certain algorithms, it finds the necessary information that helps make decisions.

There are a large number of models and methods for their systematization, for example, according to the purpose of application, scope of acceptable applications, method of evaluating variables, etc.

Types of information technology support and decision making.

Based on the goals and options available to the user, ITDS are divided into three types:

- Decision support systems (DSS)
- Expert systems (ES)
- Automated expert assessment systems (AEAS)

The decision support system (DSS) is designed to perform the following tasks:

- Selection of the most suitable solution from a variety of possible (optimization);
- Ordering of feasible decisions by preference (ranking).

Any real task can be a problem to find a solution to. The sphere of application of the DSS is a non-standard situation or a semi-structured problem.

Various methods are used to analyze and derive solutions to a problem in DSS:

- Search of information;
- Intelligent data analysis;
- Finding the required values in databases;
- Situational analysis, etc.

Artificial intelligence has been used to develop some of the methods.

Expert systems (ES) is one of the artificial intelligence systems based on a set of separate programs and applications. It imitates logic and simulate the actions of professional specialists. That is why the system acts as a highly specialized expert, which is able to replace a person.

The tasks solved by expert systems include:

- Formation of tips for users;
- Analysis;
- Search for a solution to the problem, etc.

A feature of this system is the solution of problems from certain areas. The main advantage of ES is the ability to preserve, accumulate and update highly specialized knowledge.

Automated expert assessment systems (AEAS) are computer automated systems based on the analysis of experts' assessments in solving the problems posed.

The main task of AEAS is to solve difficult management tasks with the help of correct, correctly processed and used information.

The distinctive properties of AEAS are:

- The complexity and multilevelness of the system, which allows for analysis from setting a specific goal to finding a result.
- Ability to carry out a comprehensive assessment of objects with the help of professional specialists.
- The need for an expert's quality assessment, etc.

The process of processing expert information, which makes it possible to obtain the resulting expert assessment, occurs after these assessments are received from each expert of the commission. In particular, the ASEO contains algorithms for obtaining the resulting quantitative and qualitative assessments, resulting rankings, classifications, etc.

Decision support information technologies can be used by all managers, regardless of their level. They also allow a person's analytical abilities to work on a completely different level. The process for solving the problem in this case takes place in conjunction with the methods of developing and analyzing alternatives.

Application of decision support systems in practice.

Decision support systems are effective for use in industries that do not have a lot of nuance. In practice, the subject for DSS is risk analysis, asset management, financial analysis, marketing of sales and purchases, etc.

Industries requiring the use of DSS have similar characteristics:

- Large amounts of information
- Lots of processes focused on analytics
- Fast response to processes occurring on the market

– Strategic planning and management

Initially, decision support systems gained popularity in the banking sector. In this industry, these systems are used to monitor various components of banking, for example, to analyze risks, identify cases of fraud, service plastic cards, and create new financial services. Without a DSS, it is impossible to ensure mass lending. If loan officers are involved in accepting each application, this will significantly increase the cost of the service and the procedure itself will take more time. Also, the human factor cannot be ruled out, therefore, making mistakes. All this leads to a slowdown in the work of the bank.

Another area of DSS application is telecommunications. Here these systems are used to analyze customer preferences and form groups with similar interests, which makes it possible to carry out effective marketing projects in order to make the service most popular. This helps to retain loyal customers and attract new ones.

DSS is also actively used by trading companies for planning purchases, analyzing joint purchases and identifying typical customer actions. So, the purchase of certain types of goods is carried out depending on the seasons. For example, the demand for tangerines increases during the New Year. Since the customer often purchases complementary goods at the same time period, the DSS helps to analyze their use, which allows such goods to be placed side by side. For example, computer mice are located near computers. Behavior analysis makes it possible to calculate how long it will take for a customer to return for a product. So, when buying a printer, after a while, the consumer needs to buy paper, which makes him return to the store.

In insurance, the use of DSS is similar to banking. Analyzing potential fraud cases can help reduce their occurrence in the future. Also, insurance organizations by analyzing insured events can reduce their costs. Customer classification helps to identify a list of frequently used services, which allows an enterprise to reorient its operations.

The decision support system is also used in the educational sphere. For example, this system is effective for the allocation of budgetary and commercial places for various educational programs when conducting a reception company in higher educational

institutions. This reduces the impact of subjective factors on the outcome of admission planning.

Expert systems also have a wide range of applications. They are used in medical diagnostics to identify the alleged causes that influenced the violation of the body. The most well-known diagnostic system capable of determining a diagnosis at the doctor's level is MYCIN. Expert systems have interpretive functions. With their help, based on the results of observation, you can get certain conclusions. Some types of systems are able to combine the knowledge of several experts, thereby combining different methods of examination. Also, these systems are used in areas such as forecasting, planning, training, etc.

Expert systems are widely used in many areas.

For example, in psycholinguistics, these systems make it possible to predict the effect of the impact of texts on a significant circle of people, create texts with the necessary vector of influence and conduct their in-depth content analysis.

AEAS is also used in the communication field, as it allows to identify damage in the telephone network and recommends ways to eliminate these incidents. The systems work without involving people.

Conclusion

Thus, this article discusses the main features of information technologies for decision support, which are focused on problems that have a poor structure, combining canonical methods of accessing and processing information with the capabilities of mathematical models and methods for solving problems based on them. The main types of these systems are also identified: decision support system (DSS), expert system (ES), automated expert assessment system (AEAS). Each type of system has its own characteristics and features. These systems have many advantages and are used in various industries, such as banking, communications, insurance, psycholinguistics, and many others. This widespread use of information technologies to support decision-making allows us to draw a conclusion about their effectiveness. We can assume that the demand for these systems will only grow, which will cause their improvement and subsequent implementation in all areas.

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