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INTELLECTUAL LOGISTICS INFORMATION SYSTEMS

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Abstract
The use of Artificial Intelligence in real practice involves taking into account the specific characteristics of the problem area, which can be characterized by the following set of characteristics:

- • quality and efficiency of decision-making;
- • ambiguity of goals and institutional boundaries;
- • the number of entities involved in solving the problem;
- • randomness, fluctuation and quantization of environmental behavior;
- • the number of factors affecting each other;
- • weak formality, originality, stereotyping of situations;
- • secrecy, secrecy • secrecy of information;
- • deviance of plan implementation, importance of small actions;
- • paradoxical logic of decisions, etc.
- Artificial intelligence is formed in the creation of information systems and information technologies to increase the efficiency of knowledge management, to make decisions in the conditions related to the emergence of problematic situations. in this case, any life or business situation is described in the form of some cognitive model (cognitive scheme, archetype, framework, etc.), which is then used as a basis for modeling, including computer construction and implementation.
- Classification of tasks solved by IAT:
- Data interpretation. This is one of the traditional tasks for expert systems. Interpretation is the process of determining the meaning of data, the results of which should be consistent and correct. Multivariate data analysis is usually provided.
- • Diagnostics. Diagnostics refers to the process of determining the relationship of an object to a certain class of objects and/or a fault in some system. A fault is a deviation from the norm. This interpretation makes it possible to consider malfunctions of equipment in technical systems, diseases of living organisms and all kinds of natural anomalies from a single theoretical point of view. Here, the need to understand the functional structure ("anatomy") of the diagnostic system is an important feature.
- • Monitoring. The main task of monitoring is continuous interpretation of data in real-time mode and giving a signal about deviation of certain parameters from permissible limits. The main problems are the "missing" of the situation of concern and the reverse function of the "false" positive. The complexity of these problems is the blurring of symptoms of anxiety-provoking situations and the need to take into account the temporal context.

• Design. Design is the preparation of specifications to create "objects" with predetermined properties. The specification means a set of all necessary documents - a drawing, an explanatory letter, etc. The main problems here are obtaining a clear structural description of the knowledge about the object and

the "trace" problem. In order to organize an effective design, and even more so, to redesign, it is necessary to formulate not only the design decisions themselves, but also the reasons for their adoption. Thus, in design tasks, two main processes that are carried out within the framework of relevant es are closely related to each other: the process of deriving a solution and the process of explanation.

• Forecasting. Forecasting makes it possible to predict the consequences of certain events or events based on the analysis of available data. Predictive systems draw logical consequences from given situations. A predictive system typically uses a parametric dynamic model whose parameter values are "adapted" to a given situation. The results from this model serve as the basis for forecasts with probabilistic estimates.

• Planning. Planning means finding plans of actions related to objects capable of performing certain functions. Such memory uses models of the behavior of real objects to logically determine the consequences of planned activities.

• Training. Education refers to the use of computers to teach a particular discipline or subject. Learning systems detect errors and offer correct solutions in learning any subject with the help of a computer. They collect knowledge about the hypothetical "student" and his characteristic mistakes, then at work they can diagnose the weaknesses in the students' knowledge and find the appropriate means to eliminate them. In addition, they plan to communicate with the student based on the student's progress to impart knowledge.

The decision-making process (PPR) in logistics can proceed according to two main schemes: intuitive-empirical (based on the comparison of the problem situation with similar situations encountered before) and formal-heuristic (based on the construction and study of a model of the problem situation) . Regardless of the PPR flow chart, providing management with information is one of the decisive factors for effective decision-making. Usually, management information means a set of information resources, tools, methods and technologies that help to effectively implement the entire management process, including the development and implementation of management decisions.

When creating a model of a problem situation, the structure of PPR is studied, which is determined by elements such as the state of initial information of the problem, the model of the decision-making situation, constraints, decision options and their consequences, external factors of an objective and subjective nature. The combination of these elements constitutes a certain decision support environment (system). In other words, spp is a system that provides the decision-maker (decision-maker) with information, knowledge, conclusions and/or recommendations necessary for decision-making. Data mining tools and related technologies are "data mining", very complex and diverse. These include: neural networks; fuzzy logic; new correlation analysis algorithms; time series analysis; exception handlers; methods of visualizing analysis results. Expert systems in the field of logistics. Expert systems in the field of logistics are special computer programs that help experts make decisions related to the management of material flows. An expert system can collect the knowledge and experience of several experts working in different fields. The work of highly qualified specialists is expensive, but, as a rule, it is not required every day. The ability to get advice from experts on various issues by turning to a computer allows for competent solving of complex problems, increases the productivity of employees, and at the same time does not require the costs of state support for highly paid specialists.

The use of expert systems allows:

• making quick and quality decisions in the field of materials management;

• training experienced specialists in a relatively short time;

• save the "know-how" of the company, because the employees using the system cannot transfer the experience and knowledge contained in the expert system outside the company;

• using the experience and knowledge of highly qualified specialists in prestigious, dangerous, etc. workplaces.

Disadvantages of expert systems should include limited possibilities of using "intelligence". Logistics processes include many operations with different types of cargo. Not all features in the Expert program can be considered. Therefore, in order not to put a 100 kg box in a 5 kg box, the user must have "common sense" that complements the knowledge of the expert system. Expert systems are used at various stages of the logistics process, which makes it easier to solve problems that require a lot of experience and time. For example, in a warehouse when making a decision on replenishment of stocks, when the manager has to evaluate a large amount of different information: expected prices taking into account the purchased goods, delivery rates, the simultaneous availability of stocks in different positions of the assortment. the need to fill in, etc. here, the use of expert systems allows to make not only correct, but also quick decisions, which is often important. The focus on computer information technologies allows us to distinguish a new class of sppr - information and analytical systems for decision support (IA SPPR). IA SPPR is a class of human-machine systems designed to assist decision makers in their professional activities of using data, knowledge, and models to prepare and make informed decisions. Automated SPPR features are most clearly manifested within the following classification features: conceptual models; problems to be solved; areas of application. Taking into account the existing conceptual models of SPPCh, approaches based on the use of information systems ideology, artificial intelligence and instrumental approach are distinguished. Within the framework of the information approach, spp belongs to the class of automated information systems, the main purpose of which is "to improve the performance of mental workers in organizations using information technologies." The main components of this model are: user-system interface, database and model base. In the framework of "intelligent systems", spp, based on knowledge that is significantly different from expert systems in terms of the goal, spp is designed to help the decision maker in solving the problem in front of him, and es - to replace the person in solving the problem. With the instrumental approach, depending on the specific characteristics of the tasks to be solved and the technological tools used, three levels of systems are distinguished: practical; generators; and instrumental. Practical SPPR serves to support the solution of individual practical problems in specific situations. End users (individuals or groups of people) work with them. Generators are a set of software tools for data retrieval and extraction, modeling, etc., used by practical SPPR developers to create custom systems. Generators can be quickly "installed" in the application system. Instrumental SPPR is compatible with the highest level of production and provides the most powerful set of tools related to a single methodology at the disposal of developers. Decision support systems, DSS (decision support systems-DSS), are increasingly used in government and commercial structures to optimize the business of an institution or company. Without special programs of SPPR, it is impossible to support decision-making with information during the business processes of the enterprise. The operation of SPP must rely on data mining software tools, supported by mechanisms for visualizing reports of analysis results in a form understandable by end users, and tools for extracting

the necessary data from various sources, called data mining tools. Data warehouse and data marts technologies are offered for this purpose. Four groups of software products for building SPPR can be distinguished:

- user request generation and reporting tools;
- data interpretation tools;
- data analysis tools;
- data warehouses.

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