

INTELLECTUAL INFORMATION TECHNOLOGIES FOR RECOMMENDATIONS IN AN EMERGENCY SITUATION

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Анотація

Розглянуто актуальність задачі надання рекомендацій у надзвичайній ситуації. На основі здійсненого аналізу інформаційних процесів, наведено структурну організацію системи надання рекомендацій у надзвичайній ситуації.

Ключові слова: надзвичайна ситуація, система оперативно-диспетчерського управління, надання рекомендацій, експертні системи.

Abstract

The paper studies the task of providing recommendations in an emergency situation. Based on the analysis of information processes, the structural organization of the system of providing recommendations in an emergency situation is given.

Keywords: : emergency situation, operational-dispatching management system, providing recommendations, expert systems.

Introduction

The modern pace of human life requires the involvement of information technology in a wide range of actions that were previously performed mainly by hand.

At the present stage, intelligent information technologies are becoming quite widespread. In particular, it would be most appropriate to highlight the widespread introduction and active development of expert systems technologies, technologies for providing recommendations, technologies for decision-making systems. These technologies are very widely used in various spheres of human life: banking, business, the structure of government agencies.

In this context, it would be appropriate to consider the possibility of introducing such intelligent technologies in the field of emergency management.

The purpose of this study is to analyze the system of operational control for the elimination of threats and emergencies, as well as prospects for the use of intelligent information technology for the tasks of providing recommendations in an emergency.

Information needs analysis

The basis of the functioning of the civil service units for emergencies is the prevention and elimination of emergencies (EM) of natural and man-made nature, as well as providing recommendations to persons involved in emergencies. In today's society, in the rapid development of information technology, it is important to create so-called referral systems for ordinary users, the concept of which contains an IT strategy that is closely correlated with the needs and requirements of specific departments. The main idea of introducing emergency recommendation systems is to minimize subjectivity in assessing and deciding on a specific situation. [1]

In this context, it is advisable to use the technology of expert systems with fuzzy logic, because it provides an opportunity to obtain as source information not only solutions but also the necessary explanations. Although the technology of working with an expert system is not simple, the user interface of these systems is friendly and usually does not cause difficulties in dialogue. [2,3]

Review of existing solutions

Existing solutions currently provide for registration, call processing and dispatch of rescue equipment, which is carried out using the software and hardware complex of the operational and control system (SODU). This system was first introduced in Ukraine in 2007 in Lviv. [4,5]

The main task of this system of liquidation of threats and emergencies is to create procedures, strategies and schemes for integrating the structure of the Ministry for Emergencies into production substructures to reduce human losses and material resources during the elimination of threats and accidents. Integration is based on the creation of a common terminal network for data exchange, routing of communication channels and the development of a coordination strategy to eliminate the consequences of emergencies, taking into account the cognitive thinking of operational and command and management staff in high risk. [4,5]

The purpose of SODU is the maximum automation of dispatching functions, reduction of terms of processing of calls and sending of equipment that is a decisive factor at liquidation of emergency situations, rescue of people. [6]

Due to the rather large expansion of the functional capabilities of SOD, it unfortunately does not implement intelligent technologies, in particular modules for providing recommendations, modules for decision support. Therefore, the development of information technology for providing recommendations in an emergency is relevant.

Analysis of information processes and structural organization

The system of operational and control management for the elimination of threats and emergencies contains the following components:

- the improved interface of the automated workplaces of dispatchers;
- system of geopositioning of the main emergency rescue equipment;
- software modules of the algorithm of actions of the dispatcher, diagnostics of work of system and a condition of communication channels, calculation of routes of movement of emergency rescue equipment;
- modernized departmental VPN computer network;
- geoinformation server. [5,6]

Based on the above, to improve SOD, it is proposed to develop information technology for providing recommendations in an emergency situation, based on the integrated application of expert systems technology and fuzzy logic, and is based on a software shell and knowledge base. [7]

The knowledge base consists of rules: facts and consequences according to antecedents and questions. The software shell includes:

- knowledge base;
- logical inference mechanism;
- user interface;
- subsystem of explanations;
- subsystem of knowledge replenishment;
- parser;
- data entry / correction subsystem

Conclusions

The existing methods and systems for solving the problem of providing recommendations in an emergency are considered. Analysis of modern intelligent information technologies has shown that it is advisable to use integrated technologies of expert systems and fuzzy logic.

The analysis of information processes and the structural organization of the system of providing recommendations in an emergency situation are given.

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